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THE Journal of Home Economics

VOL. II.

FEBRUARY, 1910

No. 1

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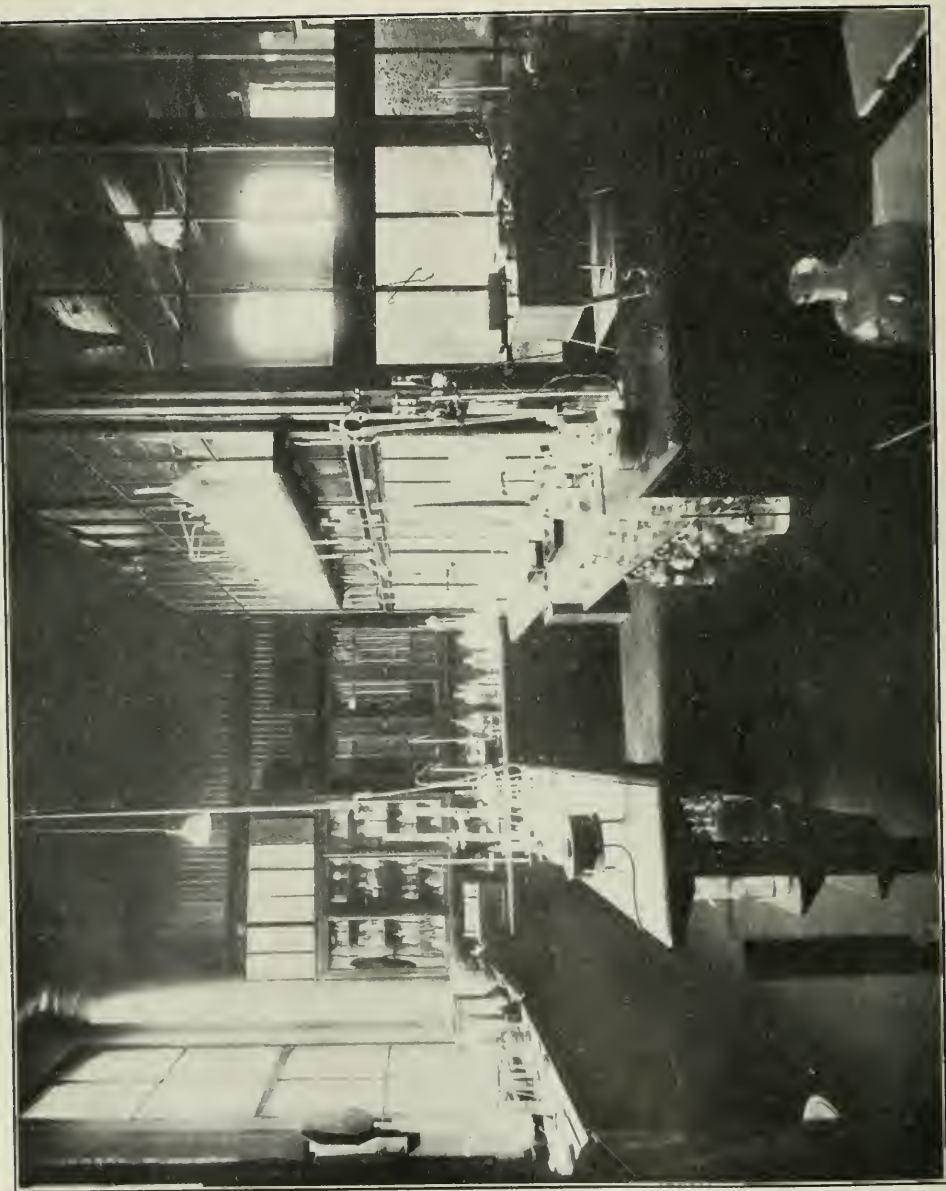
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AN INTERIOR VIEW OF MRS. RICHARDS' LABORATORY, MASS. INSTITUTE OF TECHNOLOGY. BOSTON, MASS.

THE Journal of Home Economics

VOL. II.

FEBRUARY, 1910

NO. 1.

BOSTON CONVENTION AMERICAN HOME ECONOMICS ASSOCIATION.

The second annual convention of the American Home Economics Association was held in Boston, December 30, 1909, to January 1, 1910, as the guest of the New England Home Economics Association, Simmons College and Mass. Institute of Technology. Some 150 delegates gathered for the convention, the majority naturally from New England and the East, but representatives as well from Quebec, Ontario, Wisconsin, Illinois, Minnesota, and South Carolina, with persons from almost every nearer center. In point of numbers this year's meeting showed a good increase on the attendance at the first convention held last year in Washington.

The American Association for the Advancement of Science, with its score and more of affiliated societies, held its meeting in Boston during this week so that members of the Home Economics Association enjoyed meeting workers in other fields and several of them were in turn able to contribute to the program of the Home Economics meetings.

The program provided a first day devoted to preliminary meetings and excursions, and two days of general and sectional meetings. On Thursday, December 30, the Executive Committee held a meeting and prepared business for presentation before the Council of the Association which met in the afternoon at the Institute of Technology. The minutes of the Council (p. 9) show the action taken.

The first general session of the convention was held at Simmons College, Friday morning, at 9:30. An address of welcome was made by President LeFavour, of Simmons College, and a response by Mrs. Richards, President of the Association. The topic of the morning session was The Sciences in Relation to Home Economics. Four papers were presented: (1.) Physics, Charles L. Norton, Massachusetts Institute of Technology; (2.) Chemistry,

James F. Norris, Simmons College, Boston; (3.) Physiology, Percy G. Stiles, Simmons College, Boston; (4.) Bio-Chemistry, William J. Gies, College of Physicians and Surgeons, Columbia University. There was an audience of fully two hundred, and great interest was shown in the addresses as they proceeded. At the close of the program a brief business session was held at which the views of delegates regarding the annual meetings of the Association were asked.

After the adjournment of the morning meeting the delegates proceeded to the Hotel Westminster, where the annual luncheon was served. The luncheon brought together a party of one hundred and twenty-five. Miss Sarah Louise Arnold, Dean of Simmons College, and Chairman of the New England Home Economics Association, presided and brief toasts were responded to by several persons. Mrs. Richards spoke on Euthenics, the science of controllable environment, which is to be, she said, the next advance in the field of Home Economics. Miss Arnold, Miss Berry, Miss Kinney and Miss Van Rensselaer spoke on various phases of the work of the Association, taking as their subjects the four words forming the name of the Association. Dr. C. F. Langworthy presented an interesting statement of the activities of the government in fields related to the organization. Mrs. Abel responded to the toast, *The Old Guard*, and told of the beginnings of the Home Economics movement twenty years ago in the New England Kitchen in Boston. After these addresses the roll of all present was called, and each responded with a word of greeting, thus at once promoting the mutual acquaintance of the delegates.

At the close of the luncheon the delegates divided and attended three sectional meetings which had been arranged. There was a conference on High School Work and on Domestic Art, presided over by Miss Bevier; another for Domestic Science workers, in charge of Mrs. Richards; and a third for dietitians, arranged by Miss McCullough at the Massachusetts General Hospital.

In the first section two topics were presented: Vocational Tendencies in Home Economics, and the Relation of Fine Art to Domestic Art. Mr. Weaver of the Practical Arts High School, Boston, Mrs. Hyde, of Newton Technical High School, and Mrs. Williams of New York City Schools, spoke on Vocational Tendencies. The Fine Art topic was treated in papers by Miss Starbird

of the Practical Arts High School, Boston, and Miss Stone of the Brookline High School.

In the Domestic Science session the topics considered were Economy of Materials in Domestic Science Teaching and the School Lunch. The first topic treated of efforts to utilize the cooked materials of Domestic Science teaching, either by sale for public use in school lunch rooms, or by their transfer to the homes of the pupils. Papers or addresses were given by the following:

Mrs. Mary Pierce Van Zile, Kansas State Agricultural College; Miss Mary B. Van Arsdale, Teachers College, Columbia University; Miss Mabel Campbell, New York City Public Schools; Miss Helen G. Flagg, Trade School for Girls, Cambridge, Mass.; Miss Hutchins, Hebrew Technical School for Girls, New York; Miss Eunice C. Strong, Fairhaven, (Mass.), High School; Miss Alice C. Boughton, Starr Centre House, Philadelphia, Pa., and Miss Gwendolin Stewart, (paper on School Dinners in London Schools).

The dietitians held a meeting at the same time at the Massachusetts General Hospital which brought together some sixty interested persons and was the beginning of what is hoped may become a section for those interested in institutional management. The speakers were Miss McCullough of the Massachusetts General Hospital, Miss Nutting of Teachers College, Miss Dike, of Simmons College, and Dr. Boos of the Massachusetts General Hospital staff.

Friday night a general session of all delegates had been arranged at the Institute of Technology with a discussion of Recent Progress in the Study of Nutrition in Relation to Dietetics. The speakers were, Professor Henry C. Sherman of Columbia University, Professor Lafayette B. Mendel, of Yale University and Professor Otto Folin of Harvard University. This was one of the largest gatherings of the convention, the lecture hall being crowded with delegates and persons from the city. The keenest appreciation was shown in the discussion of the latest advances in the science of nutrition.

For the Saturday morning session the delegates met again at Simmons College. The first topic treated was College Courses in Home Economics. Dr. Susan M. Kinsburg of Simmons College presented a paper on the instruction in economics given at Simmons College, and a communication was received from Dr. A. C.

True, Director of the Office of Experiment Stations, U. S. Department of Agriculture, representing a committee of the American Association of Agricultural Colleges and Experiment Stations which is preparing a report on a course of study in Home Economics in these colleges. Acting on Dr. True's suggestion, it was voted to appoint a committee representing the Home Economics Association to confer with Dr. True's committee. A third paper on the same general topic A Survey Course in Home Economics, by Dr. Edna D. Day of the University of Missouri, was read by title.

The second topic on the morning program was Newer Professional Fields. Miss Bertha Stevenson of the Laboratory-Kitchen Lunch Rooms, Boston, gave a paper on Food Standards in Lunch Room Management, and Miss Louise R. Hemenway of Boston, one on Market Inspection. The subject of Child-Nurses was referred to in a communication from Elmer E. Brown, U. S. Commissioner of Education, as a new vocational field of much promise. The suggestion of Dr. Brown called out so much interest that a committee was appointed to investigate the matter and report at the next meeting of the Association.

The third topic of the general meeting was Scientific Papers and Theses. Under the heading, Apartment House Planning, a first hand study of several hundred New York City apartments, by Mrs. S. A. Saunders of the Department of Household Administration, Teachers College, was presented, and Dr. C. F. Langworthy presented a summary of an article on Progress in Nutrition during 1908-9. The remaining scientific articles, which were only read by title, were: Standardizing the Home, John R. Commons, Professor of Political Economy, University of Wisconsin; A Comparative Study of Losses in Cooking Beef, Mrs. Flora W. Green, University of Missouri; Acetylene Gas Stoves, MacDonald Institute, Guelph, Ontario; A Day's Metabolism and The Setting of Gelatin, Department of Household Science, University of Toronto.

At about eleven o'clock, the general meeting adjourned and while some of the delegates went to visit the Carnegie Nutrition Laboratory, two sectional meetings were formed, one devoted to Extension Work in Home Economics, the other to the Problems of Domestic Art teachers.

The Extension Program included a paper by Professor William D. Hurd of Massachusetts Agricultural College, on Relations of University and College Departments of Home Economics to the Outside Community; an address by Miss Van Rensselaer, and an informal discussion which helped make clear the obligations of Home Economics workers outside their institutions.

The Domestic Art section considered the topic, Hygienic Dress and was presided over by Mrs. Mary Schenck Woolman of Teachers College. Papers were presented by Dr. Dudley A. Sargent of Cambridge, Mass., and by Dr. Eliza Ransom of Boston, and a significant discussion followed.

After the adjournment of the morning meetings the delegates repaired to the lunch room of Simmons College as guests of the college at a cafeteria luncheon. Following this, they reassembled for the closing session of the convention. At this the president's annual address on The Outlook in Home Economics was delivered, and matters of business, including committee reports and the election of officers, were transacted as reported elsewhere. Then the meeting adjourned and the second annual convention ended.

One of the pleasant features of the convention was the cordial welcome given the delegates both by institutions and by private individuals. Simmons College, the Institute of Technology, and the Massachusetts General Hospital afforded meeting places, and a long list of institutions were especially opened for the visits of those interested. Mention should be made of the special arrangements made by the following institutions and establishments: Simmons College, Laboratories and Exhibits; the laboratories of Hygiene and Sanitation, Sanitary Chemistry and Architecture, at the Massachusetts Institute of Technology; Louise M. Alcott Club, 15 Oswego Street, which conducts children's classes in Household Arts and which provided a special demonstration for the delegates; the School of Domestic Science, Miss Forehand, Principal, 40 Berkeley Street; Miss Farmer's School of Cookery, 30 Huntington Avenue; Laboratory-Kitchen Lunch Rooms, 69 Bedford Street, Miss Stevenson, President; Sunshine Laundry, Misses White, 8 Flora Street, Brookline; Whitcomb & Barrows, Publishers, Huntington Chambers, Boston; Women's Industrial and Educational Union, 264 Boylston Street; Out-door School for Tuberculous Children, Franklin Park, Dorchester; The

Brookline High School; the Garland Home School, Mrs. Stannard, Principal; and the Exhibit of Modern Cooking Appliances, at the Barnard Memorial.

Several social gatherings were arranged by friends of Home Economics in Boston which contributed greatly to the pleasure of the delegates. On Thursday afternoon, Mrs. Henry M. Whitney invited the members of the association to attend a reception at her residence, 54 Beacon Street, to meet Mrs. Mary H. Abel, Editor of the *JOURNAL OF HOME ECONOMICS*. For Thursday evening, Mrs. Mary Morton Kehew had issued invitations to a musicale at her home on Chestnut Street which brought together members of the scientific societies meeting in Boston and also of the Home Economics Association. On Friday afternoon at 4 o'clock, Mrs. Stannard of the Garland School received the members of the Association in an informal tea at the school kitchen, and at 5 P. M., the Women's Industrial and Educational Union tendered an informal tea to the delegates at its headquarters, 264 Boylston Street. Finally, after the closing section of this convention, the delegates met in a delightful reception to Mrs. Annie Dewey, founder of the Lake Placid Conference on Home Economics, at the home of Mrs. William V. Kellen, 342 Beacon Street.

Reviewing the sessions of the Boston Convention, several distinct conclusions seem warranted. The hearty co-operation on the program of members of the societies meeting in Boston was a recognition of Home Economics which should be an encouragement to every member of the Association. Of equal, if not more encouragement is the fact attested by the program, that Home Economics workers are themselves conducting scientific studies and investigations. The plan of holding sectional meetings resulted admirably; our membership is apparently ready for further organization along lines of the separate interests which find their union in the Home Economics point of view. Finally, the Boston program emphasized the relation of natural science, physics, chemistry and biology, to the home. The next meeting while holding to and reiterating this fact ought to stress as vigorously the equally pertinent relations of economic and social science to the home and the institutional household.

MINUTES OF COUNCIL.

Council meeting, December 30, 1909, 2.30 p. m., Institute of Technology.

The meeting was called to order by the President, Mrs. Ellen H. Richards, and following the roll of the Council; the reports of the Secretary and Treasurer were read as appended below.

The recommendations of the Executive Committee were received and acted upon as follows:

It was moved by Miss Jacobs, seconded by Miss Kinney and carried, that the following recommendation be adopted as a permanent policy: The money from life members of the Association shall be invested as a permanent fund, the income only to be used for the current expenses of the Association.

It was moved by Dr. Mendel, seconded by Mrs. Woolman, and carried, that the permanent funds of the Association shall be under the control of the Finance Committee as regards investment.

It was moved by Miss Arnold, seconded by Miss Berry, and carried, that the following recommendation be referred to the Editorial Board for consideration: That a by-law be recommended to the Association to the effect that the dues of the Association shall be Fifty Cents and that subscriptions to the JOURNAL of HOME ECONOMICS shall be \$1.50 to members of the Association and \$2.00 to others, with the proviso that the Editorial Board shall have authority to determine the exact division of the \$2.00 charge as may be required in negotiations with the Post Office Department.

It was moved by Mrs. Woolman, seconded and carried, that the matter of advertisements be left to the discretion of the Editorial Board.

It was moved by Dr. Mendel, seconded and carried, that the following recommendation of the Executive Committee be adopted: That the editorial control of the Journal for 1910 be vested in an Editor-in-Chief, Mrs. Mary H. Abel, to be assisted by a Board of Contributors, representing the following divisions of the field: Education, Extension, Food and Nutrition, Textiles and Clothing, House and Sanitation, Family, Administration and Affiliated Societies; each department to have a contributing editor as recommended by the Executive Committee, such editor to be responsible for the individual field, including contributions, book reviews and abstracts; and the Board of Editors to have power to fill vacancies and add to its membership.

The following recommendation of the Executive Committee was received by the Council, discussed and referred to the general meeting for further consideration: That two annual meetings of the Association be held during 1910, a summer meeting with the National Education Association, or at Lake Placid, and a winter meeting with the Economic and Sociological Societies, and that two committees on program be appointed, responsible for the respective meetings.

The Council then passed to the consideration of reports from affiliated societies, as follows:

New England Home Economics Association, Miss Eliot; Home Economics Association of Greater New York, Miss Willard; Association of

Teachers of Cooking in New York City, Miss Daley; Housekeepers' Alliance, Washington, Miss Jacobs.

Written reports were presented from the Home Economics Club of Grand Rapids and Iowa State Economics Association.

On successive motions, the following committees were authorized to be appointed by the chair, and appointments were later made as follows:

COMMITTEE ON AFFILIATED SOCIETIES.—Miss Van Rensselaer, Chairman, Miss Daley, Miss Jacobs, Miss Eliot and Miss Willard.

AUDITING COMMITTEE.—To review Treasurer's report: Miss Berry.

PERMANENT COMMITTEE ON FINANCE.—Miss Talbot, University of Chicago, Miss Lord, Pratt Institute, and Professor Norris, Simmons College.

COMMITTEE ON RESOLUTIONS.—Miss Jacobs, Miss Weer and Miss Wilson. On motion, the Council adjourned.

REPORT OF SECRETARY.

MEMBERSHIP: At the time of the Washington Convention the membership stood at 700 members; there are now 1242 members on the list of the Association, and in addition 68 subscribers to the *JOURNAL*, making a total of 1310.

AFFILIATED SOCIETIES: The following societies have affiliated with the Association: The Home Economics Association of Greater New York; the Association of Teachers of Cooking in the New York Public Schools; The Housekeepers' Alliance, of Washington, D. C.; The Home Economics Club of Grand Rapids, Mich.; the Pacific Coast Conference on Home Economics; and the Iowa State Home Economics Association. Associations are also in existence or being formed in Ohio, Utah, Virginia and other centers which propose to affiliate with the Association.

ORGANIZATION OF EXECUTIVE COMMITTEE: After the Washington Convention, in accordance with the Constitution, the Council by ballot chose the following five members to act with the elected officers as an Executive Committee: Helen Kinne, Emma S. Jacobs, Caroline L. Hunt, Mary S. Snow, and Mrs. Alice P. Norton. This Executive Committee held a meeting in New York, April 28, 1909, and provided for the incorporation of the Association under the laws of the State of New York, which was accomplished May 12, 1909.

THE *JOURNAL OF HOME ECONOMICS*: After the Washington Convention the secretary was authorized by the Executive Committee of the Association to bring out the *JOURNAL OF HOME ECONOMICS* as the publication of the Association. Arrangements were made with Mr. W. F. Humphrey, Geneva, N. Y., to act as printer, and the secretary assumed the editorial and business responsibility, under the general direction of the Executive Committee. Five issues of a bi-monthly publication were arranged for, and the first two issues were edited by the secretary. Dr. C. F. Langworthy of the Executive Committee edited the third issue, after which the Executive Committee located the editorial responsibility with Mrs. Mary H. Abel, she being assisted by Dr. Langworthy and Miss Jacobs as an advisory committee.

TREASURER'S REPORT OF CASH STATEMENT.

Jan. 1, 1909, to Dec. 24th, 1909.

RECEIPTS.

From Dues	\$2329.30	
" Reprints	50.31	
" Subscriptions	106.05	
		<hr/>
		\$2485.66

EXPENDITURES.

Preliminary Bulletin and Organization	\$ 94.04	
Incorporation	37.41	
Office Equipment	48.10	
Postage and Stationery	254.58	
Stenographer and Clerical Asst	464.53	
Office Expense, Incidentals	22.43	
Pamphlets and Reprints	109.95	
Transfer of Accounts (Refunds)	5.50	
Journal	1252.67	
Bank Charges (Exchange)	3.82	
		<hr/>
		\$2293.03
Balance on hand		<hr/>
		192.63
		<hr/>
		\$2485.66

MINUTES OF ANNUAL MEETING.

SATURDAY, JANUARY 1, 1910, SIMMONS COLLEGE.

The meeting was called to order at 2.30 p. m., by the president, Mrs. Ellen H. Richards, who delivered the annual presidential address on the topic, *The Outlook in Home Economics*. At the close of the address, Mrs. Richards spoke of the members of the Association who had died during the past year, Miss Maria Parloa, Miss Maria Daniel and Mrs. Morse. Various items of business were then taken up as follows:

Appointment of Committees: A communication from Dr. A. C. True, chairman of a committee of the Association of American Agricultural Colleges and Experiment Stations on a course of study in Home Economics for colleges had been received, and on motion the President was authorized to appoint a committee to represent the American Home Economics Association, and to act jointly with the committee of Dr. True. The President appointed as such committee: Prof. M. E. Jaffa, of the University of California, Mrs. Mary Pierce Van Zile, of the Kansas State Agricultural College, Miss Ellen Huntington, of the Agricultural College of Utah, Miss Isabel Bevier, of the University of Illinois, and Miss Edna D. Day of the University of Missouri.

The President, as instructed by a resolution at the morning session, appointed as a Committee on Child-Nurses: Miss Adelaide Nutting, of

Teachers College, Chairman, and Mrs. Blanche E. Hyde, of Newton, (Mass.) Technical High School, with power to add additional numbers.

Reports of Committees: Miss Berry of the Committee on Audit gave the following report which was accepted: "I do hereby certify that I have examined the accounts of the treasurer and to the best of my ability have found them correct." (Signed) JOSEPHINE T. BERRY.

The Committee on Affiliated Societies reported through its Chairman, Miss Van Rensselaer, that it would endeavor to secure a representative in the different states to develop Home Economics work among women's clubs by securing speakers and advising regarding programs of study, and in other ways.

The Finance Committee through Miss Lord reported that it had drawn up a budget for the year 1910 as follows:

Expenses of annual meeting	\$ 200.00
Postage and stationery	275.00
Journal	1750.00
Committees	75.00
Pamphlets	150.00
Incidentals	25.00
Total	\$2475.00

The last three items are to be dependent on previous expenditure.

The JOURNAL may exceed the amount stated if it seems advisable to the Executive Committee.

The fund of \$150 from life memberships is to be invested in a savings bank.

On motion duly seconded it was unanimously voted to adopt the budget as recommended.

Miss Bevier was called upon to speak regarding the Graduate School of Home Economics. She said that while the Graduate School of Home Economics was not officially connected with the American Home Economics Association, it would be a matter of interest to all members of the Association to know that plans were under way for a session of the school at Ames, Iowa, during the summer of 1910. The Graduate School of Home Economics began in the summer of 1902 when Professor Atwater invited a group of Home Economics workers to meet at Wesleyan University, Middletown, Conn., and spend some time in study in his laboratories. The next meeting of the School was at the University of Illinois in 1905, when Dean Davenport of the State College of Agriculture co-operated with those interested in Home Economics so that a number of courses of instruction were offered. In July, 1908, the Graduate School held its next session at Cornell University with the Third Graduate School of Agriculture. By co-operation with the faculty of this school the Graduate School of Home Economics was able to offer a very useful series of courses. At that meeting it was voted to make the Graduate School of Home Economics a permanent institution, meeting alternate years with the Graduate School of Agriculture. A committee was appointed to direct the affairs of the school with Miss Edna D. Day, University of Missouri, as Chairman. This Committee is now making plans for a session of school at Ames, Iowa, during the summer of 1910.

The Journal: The secretary reported for the Editorial Board that it had been decided to publish the JOURNAL OF HOME ECONOMICS during 1910 bi-monthly, with five issues as during 1909. For the present no advertising would be admitted to its pages. The suggestion that the fee of the Association might be divided between a membership fee and a subscription to the JOURNAL, thus making the JOURNAL a subscription publication and so securing from the postal authorities a ruling that would admit advertising to the pages of the JOURNAL, had been considered by the Board and action deferred for the present.

Each issue during the coming year is to be of ninety-six pages. The Editorial Board, established by vote of the Council, December 30, 1909, met during the Convention and organized as follows: Mrs. Mary H. Abel, Baltimore, editor-in-chief; Contributing Editors: Education, Helen Kinne, Teachers College, New York; Extension, Anna Barrows, Boston, Mass.; Food and Nutrition, C. F. Langworthy, U. S. Department of Agriculture, Washington, D. C.; Textiles and Clothing, Abby L. Marlatt, University of Wisconsin; The House, Isabel Bevier, University of Illinois; Administration, Mrs. Melvil R. Dewey, Lake Placid Club; The Family, Dr. Thomas D. Wood, Teachers College, New York; Affiliated Societies, Martha Van Rensselaer, Cornell University.

Miss Bevier spoke regarding the management of the JOURNAL and urged upon the members of the Association the responsibility of extending its circulation. The Board had decided to omit advertisements, she said, and maintain the JOURNAL in its present dignified form, relying for its support upon its own merits as a scientific and educational publication. Owned by the Association and published for the benefit of its members it should receive their cordial support in extending its usefulness. It was stated that a printed leaflet describing the JOURNAL would be issued which members might use in extending notice of it. Suggestions were asked for from those present as to desirable articles for publication in the JOURNAL. Requests were made for material upon the subject matter of Home Economics, methods of teaching, settlement work, cost of living, and other social and economic topics.

Election of Officers: Through Mr. LeBosquet the Committee on Nominations reported that the returns from the ballot sent out to members showed a majority of opinions favoring the re-election of the officers whose terms were about to expire, especially in view of the fact that they had served through the initial year of the Association and the work of organization was not yet complete. The Committee on Nominations therefore recommended the following persons for officers: For president, 1910, Mrs. Ellen H. Richards; First vice-president, 1910, Miss Isabel Bevier; second vice-president, 1910, Dr. C. F. Langworthy; third vice-president, 1910, Miss Mary U. Watson; secretary-treasurer, Dr. Benjamin R. Andrews; for councilors-at-large, each for five years, beginning 1910: Miss Josephine T. Berry, Miss Mamie E. Gearing, Miss Helen Kinne, Miss Catherine A. Mulligan, Mr. George A. Putnam; for member of committee on nominations, for five years beginning 1910, Miss Ruth A. Wardall.

On motion, duly seconded, the recommendation of the Committee on Nominations was unanimously adopted and the officers as named above were declared elected.

The Committee on Nominations also presented the following resolution which was adopted by the Association as an expression of its opinion but declared not absolutely binding upon future action: "Resolved: That it be the policy of the Association hereafter that Vice-Presidents, Councilors-at-Large, and members of the Nominating Committee shall not be eligible for re-election within one year."

Amendment to By-Laws: The Committee on Nominations also presented an amendment to Article I of the By-Laws. Due notice of the proposed by-law was given one month in advance in the call for the Convention. Upon motion duly seconded, the amendment was adopted by unanimous vote as follows:

By-Laws. Article I. Election of Officers. The sentence "This Committee shall prepare printed ballots subject to suggestion from members" is hereby amended to read "The Committee shall make nominations after inviting suggestions from members."

Annual Meeting: The President reported that the matter of the annual meeting of the Association had been discussed in the Council and that opinion seemed to favor a summer meeting with the National Education Association and a winter meeting perhaps with the National Economics and Sociological Societies. A further discussion of the matter was held and the subject was referred to the Executive Committee of the Association for action.

Committee on Resolutions: The Committee on Resolutions made the following report which was unanimously adopted:

Whereas we believe that the second annual meeting of the Home Economics Association has furnished its members higher ideals of service and the inspiration which will help crystallize them into definite personal effort to carry on the principles for which the Association stands:

Be it therefore resolved, that the Association express a hearty vote of thanks to the committee on program for their wise discrimination in selecting subjects and to those who through papers and discussions have contributed to the success of this meeting.

Be it also resolved, that the Association express through its secretary a hearty vote of thanks to the officials of Simmons College, Massachusetts Institute of Technology, Massachusetts General Hospital and Hotel Westminster for the privilege of holding meetings within their institutions.

Be it also resolved, that a hearty vote of thanks be given to the various public and philanthropic institutions which have afforded opportunity of seeing some of their work.

Be it also resolved, that the Association express through its secretary a hearty vote of thanks to Mrs. Whitney, Mrs. Kehew, Mrs. Stannard and Mrs. Kellen who have made possible the pleasant social intercourse which has been enjoyed; Also, to Miss Stearns and Miss Hyams who so ably made arrangement and provision for our entertainment and comfort.

On motion, the second annual convention of the American Home Economics Association adjourned sine die.

BENJAMIN R. ANDREWS, Sec.

PAPERS AND ADDRESSES AT BOSTON CONVENTION, DEC. 30,-JAN. 1.

The address of welcome by President Henry Lefavour of Simmons College to the delegates, the address of the President of the Association, and several of the papers presented are printed herewith. Other papers will appear in subsequent numbers of the JOURNAL.

ADDRESS OF WELCOME.

PRESIDENT HENRY LEFAVOUR.
Simmons College.

LADIES AND GENTLEMEN: It is a very genuine pleasure to the governing boards of the college that you have honored it by holding this, your second annual meeting, under our roof. The subject of Home Economics has been of the greatest interest to this college from the outset; and I suppose that there are more students enrolled in that department than in any two of the other departments. When we began our activities the subject, as I say, was of importance, but appeared far from systematic. It was fragmentary, diversified, and far from being in any pedagogical form. Considerable attention had been given to the proper preparation of food, to the making of attractive clothing, and to the physiology and chemistry of nutrition, but there was very little inter-relation and what a properly constituted Home Economics department should be, was, with the exception of certain theories, beyond, I think, a real expression in any institution of learning in the country. But the last seven years have shown a very great progress, and while all that had been done was preserved, much was added, and I am inclined to say that the element of economics has been the key-note to the whole progress. The formation of this Association is an indication of the general interest and of the necessity of co-operation, of comparing mutual experiences. I am glad you called it an economic Association, for I think there is no single question which is of larger importance than that of Domestic Economics. It is not enough to prepare food attractively; it is not enough to make clothing in an artistic way; it is not enough to know what are the relative nutritive values of foods; it is not enough to make sure that all the principles of sanitation are used properly; the

question at issue is how to get the most out of one's income. Now, the fundamental questions of life after all, so far as the proper physical side is concerned, are those of food and shelter and clothing; and the problem for every family is to be able, with the income which the family has, to make the most adequate use of that income, so that the family is properly clothed and fed and sheltered—up to the limits of the ability of that family. That is a pressing social question and a question which is going to become more and more pressing; and not only for the poor, not only for the laboring classes, but for those who call themselves people of moderate resources. Where a family is oppressed by the direst poverty the pressure of that poverty is almost enough to bring about results. The more difficult problem, is, when the family is not oppressed by poverty but sees poverty approaching, to be able to adapt means to ends.

But, beyond the question of the household, there are arising new questions, institutional questions. The hospitals, of course, have felt that. Almost every hospital is relatively poor, but every hospital must use food which will produce the end in question, that is, the recovery of the patients. But, beyond that, there is a set of public questions coming into view now, and that is the proper maintenance of the inmates of institutions. I think that in this state, at any rate, practically no attention has been paid to the proper economy of diet in our public institutions. The stewards who have charge of the food, the superintendents who have general charge, are interested in economy of buying; but, while they are interested, I doubt if they are intelligent as to economy of nutrition. Take, for instance, the simple question of the care of the insane, most of whom are not invalids in the sense that they need special food diets, but who must be maintained by the state and must be maintained as economically as possible. There are some twelve thousand in the State of Massachusetts, costing the state four dollars and eighty to ninety cents a week to be maintained. A saving of fifty cents per week per patient would mean thirty thousand dollars a year to the state, and I do not believe that fifty cents is the limit if the proper knowledge of the question of nutrition were applied.

All this means that the generation that is growing up must be informed as to the elements of this question. We must have teachers properly trained and we must know how to train teachers.

And it is for you, who are leaders in this movement to ascertain the proper methods in this training, the proper solution of the problem of the economic values. I congratulate you that so many are here to begin these very interesting and important sessions, and I assure you the college is very glad if it can be of any service to you.

THE OUTLOOK IN HOME ECONOMICS.

ELLEN H. RICHARDS,

President of American Home Economics Association.

In the vegetable kingdom it often happens that the seeds of evanescent forms of plant life sprout quickly, reach maturity quickly and die soon. The hardy oak, however, grows slowly from a seed buried in the ground for perhaps two years.

Similar laws seem to hold in the animal kingdom. Lordly man boasts of his long infancy as indicating a long life of working power. In the world of ideas, slow growth is not noticed, is difficult to trace and the eager mind is often discouraged, thinking the seed dead when it is only dormant, gathering strength for future development.

It frequently means stability, this long waiting for the world to adopt the schemes presented to it.

To us, today, is given to see the tree of our nurture, with its roots firmly planted and branches spreading from sea to sea. The seed of it was planted many years ago and has many times been dug up to see if life existed.

Home Economics, the preservation of the home and the economics of living occupy a large place in the transactions of societies and even in the daily press.

Just what do we, as a national organization, stand for? What is our endeavor for the immediate future?

First, I think, is the willingness to learn—the acceptance of a need to know.

Second, as a result is a hearty support for investigation, for scientific research—the acquisition of knowledge.

Third, the immediate application of acquired knowledge to matters of daily living and eagerness to apply means; a belief that mental and moral development are affected by physical environment; that it is not beneath science or philosophy to take note of the consequences of daily food and shelter and the problems of cleanliness.

It is perhaps the contact with our alien population that has taught us how much may be done in a short time. It is a gathering together of all lines of scientific research for the last one hundred years that gives us courage to go on.

The past has been an iconoclastic age, but we are entering a constructive one. Old traditions are being torn up by the roots. New principles of action are being examined very closely before acceptance.

The family meeting place, the home, and its maintenance are in the focus of sociologic and economic study. All the resources of science, physics, chemistry, biology, architecture and mechanics, are being brought to bear on the problems. We who have been working in the dark, both as to our own aims and as to others are now in the open trench with the light of Heaven above, but with confining walls on either side. We see eager hands held out to help us. Our mission is now to encourage, and sometimes, to restrain the eager multitude.

Just what do we see before us?

First, a determination of values in material things of daily maintenance in terms of human efficiency, this efficiency to be of the mind and soul as well as of the body.

Second, a readiness to clear away all the obstructions to this clearer road.

It is a vision. We need a sight of the goal, something to work for. Whatever hinders must be removed. There must be an end to be gained, however, not mere wanton destruction.

A good illustration is the running of an electric trolley line through an old, picturesque but decayed village to an enterprising town beyond. It is a pity to cut the century-old trees to widen the beautifully narrow streets; to disturb the peaceful old people; to kill a few perhaps before they become accustomed to the speed. The aesthetic on-looker wrings his hands at the seeming desecration. So he does over the going out of the woman from the shelter of the leaking home-roof to earn money to mend it. He covers his eyes from the sight of apartment houses and restaurants, from the counters piled high with ready-made garments. He mourns the offer of a school lunch to underfed children. He holds to the parent's duty to care for his children; to the wife's duty to spend her husband's money and only his; and meanwhile, the children are being sacrificed.

The school, the settlement, and the research laboratory are all to work together for the final betterment of the home. When a smooth boulevard is to be built through a city, the preliminary upheaval is disheartening, but necessary if a firm foundation is to be laid. Just so, in mental and moral readjustments, there is a time of broken-up traditions, of foundations that have served their purpose and must give way to more suitable structures.

The word I wish to leave with you is—Courage—Faith in the evolution of the race—Progress by the very means which seem at first sight to destroy all cherished ideals. This courage can only come through a basis of scientific truth, that truth which will, in the end, prevail.

THE RELATION OF DOMESTIC ART TO FINE ART TEACHING.¹

GRACE G. STARBIRD.

Practical Arts High School, Boston.

In considering this subject, the Relation of Domestic Art Teaching to Fine Arts Teaching, I shall endeavor to discuss the aim of the Art Course in a vocational school such as the Practical Arts High School of Boston as compared with that in an ordinary academic high school. In the Practical Arts School we strive to acquire knowledge not for its own sake, nor for abstract discipline, but for use in the practical problems of every day life. The principles taught are those which should be taught in any high school, for they are vital to all art teaching. The objects studied and designs created are related, however, to the life of the students and to their vocational work.

Every woman is a living example of good or bad taste as is shown by her dress and her immediate surroundings. The art work of this school has for its aim the cultivation of taste, the establishment of ideals, the acquirement of skill in expression of visual perceptions and mental conceptions by both freehand and instrumental drawings; the analysis, classification and harmonization of color; the re-creation or adaptation of given designs to new conditions or requirements. Since our vocational work at present includes dressmaking, millinery and household science our art course includes costume drawing and design and house-

¹Presented before Domestic Art Section, Boston Convention, American Home Economics Association.

hold decoration and furnishing with their accompanying problems. As we have no more time for drawing than the regular high school we cannot achieve great things but we trust that by earnest effort our observation and appreciation of fine things will be much improved.

In the ordinary academic high school, drawing is pursued under three heads: Representation, construction and composition. We preserve this same classification.

Representation trains both the observation and the judgment and brings the pupil in close touch with the objects of his environment. Rapid sketching and memory drawing as a means of expressing ideas are of infinite value to the craftsman. We study the objects with which we are directly concerned in our vocational work, such as patterns, furniture, details of interiors, gowns, hats and their accessories; the perspective principles involved in portraying the same; and the use of different mediums and modes of expression.

Under construction we study not only the appearance but also the facts of form and the principles and conventions belonging to their portrayal in the line language of the work-shop. Geometrical drawing, diagrams of the model and individual dress forms, scale drawing, simple plans and elevations of rooms, dwellings, and furniture whether of existing forms, of original designs, or of modifications and improvements, all find their place here. The ability to talk intelligently with the pencil in the language of the mechanic may become of untold value to the housewife in her dealings with the practical matters of the household.

The principles of composition are fundamental to all art, to architecture, to sculpture, to painting and to all forms of applied art. These we study in their relation to the practical problems of daily life. We learn to analyze costume and articles belonging to the home from the standpoint of line, form, and color so that we may know why an article is good or bad. We learn that in art all things are relative, that objects not bad in themselves may be bad when associated with others with which they have nothing in common. Designs for costumes with their accessories, for the decoration and furnishing of a home, or the objects of utility or service in the home give us many and varied problems.

Experimentation, comparison and choice are essential to our development. Life, however, is too short to try many experiments unless the methods of trying them are very simple. To construct things of fabrics, wood or metal in order to test them and prove which is best and fittest requires too much waste of time and material. It is here that drawing holds first place. The realm of experimentation with a pencil is wonderful and fascinating; it is almost as unlimited as thought itself. When by a sketch in line or color a dressmaker or decorator can place before herself and others many ways of doing a thing, she makes possible the choice of the best, the fittest, the most beautiful. She hits the mark because her sketches have made possible a vivid comparison.

Systematic color training, which belongs to the study of composition and representation as well, includes the analysis and classification of color, the study of tone relations, the effect of colors upon one another and upon the individual, and the scientific reasons why certain color qualities are not advisable for use in costume and home furnishing. The ability to define any color and express it in formulas so that it may be visualized and reproduced when not in the presence of the original is of great value.

The possession of beautiful pictures, statues or rugs does not insure a beautiful home. The home should be a unit perfectly adapted to the life and circumstances of its occupants. Every object in it should be chosen with the thought of its relation to other things with which it must be associated. This is essential to that unity which gives repose. Without this relationship homes become museums. Line, form, and color are the elements with which we create these relationships. Rhythm, balance, and harmony are the three great principles which guide in establishing these relations. A working knowledge of these principles gives us a basis of judgment which fashion does not weaken. The desire for novelty and change is a powerful factor in our modern life and fashion is a dictator to whom many are willing slaves. To be able to analyze the modes and select those things which are good because they conform to the vital principles of true beauty is a means to real satisfaction as well as to economy. Ideas which are based on reason and good taste will

never appear wholly bad while those whose only reason for being is that they are new are the most fleeting.

A costume becomes a work of art when its structural lines are perfectly adapted to the material and to the figure which they are to clothe, enhancing its natural charm or concealing or agreeably modifying any imperfection it may possess, when there is perfect co-ordination in the lines belonging to the different parts of the gown as backs and fronts, waists and skirts; when the several parts are beautiful in proportion; when the essential features are made the decorative instead of the decorative being mere superfluities; and when the quality of its color brings out the best that is in the wearer. The dress should be to the woman like the setting to the jewel. It should never be permitted to be her rival.

Our art courses should develop correct vision and excellence in execution, a refined taste and appreciation of fitness, adaptability, discrimination and versatility, a judgment based on reason and not on fancy and power to record ideas so they may be developed by the trade worker. In fact the art training ought to lift the student from the plane of a mere trade worker who can simply execute given problems with her hands, to that of the intelligent worker with fine impulses who can make an art of whatsoever vocation she may undertake. We can make an art of anything if we give it sufficient thought and attention and carry it out in accord with the ideal.

STANDARDIZING THE HOME.¹

JOHN R. COMMONS.

Professor of Political Economy, University of Wisconsin.

If our government were turned over to an anti-poverty syndicate on such terms that the syndicate should have a half of the increase in national wealth produced by its conservation of human resources, the syndicate would at once invent standard units for the measurement of costs and results. Uniform accounts and cost-keeping on the basis of such standard units are essential for an electric or gas or street-car or iron and steel syndicate in deciding which of its plants is most economical, which of its managers is most efficient, or which of its inventions and experiments is most promising. A gas syndicate would go bankrupt if a thousand feet of gas meant a different amount of light, heat, moisture, pressure or rate of flow in its different establishments. Every branch of engineering has its learned societies and scientific experts whose most important work is that of agreeing upon standard units to be adopted throughout the industry. Now that another kind of engineering—"social engineering"—is emerging from the speculations and theories of economics and sociology, we, too, are compelled to pause at the threshold in order, first of all, to agree upon the units by which we shall compare our costs and our results.

What is the unit that we are seeking? The electric engineer, or steam engineer, or water-power engineer, seeks a unit for measuring the output of energy—a "kilowatt" or a "horse-power." He seeks also his units of cost—the quality and cost of the coal consumed, the capacity and efficiency of boilers and engines. Our unit of output relates to the health, longevity, industrial ability, comfort and welfare of human beings. Our units of cost are food, shelter, clothing, occupation, education. We have our statistics of health which tell us something of our output, and we are trying to do something toward minimum standards of food and housing. But our efforts are haphazard

¹Presented before the Boston convention of American Home Economics Association. See also articles on Standardization of Housing Investigations, in *Publications of the American Statistical Association*, December, 1908, and A Score Card for Houses, in *Wisconsin Alumni Magazine*, January, 1910.

because we have no units by which we can compare costs with output. This is especially distracting, because, under our form of government, our courts forbid interference that goes beyond their ideas of what is necessary, and we have no standards by which we can enlighten them.

Then, too, our units are quite complex, and there are a lot of personal elements that baffle us. But is this a fatal difficulty? Only in case we attempt too much. There are margins of variation in every branch of applied science. Let us break up our problem and begin with the most essential. This is the home, and the basis of the home is the dwelling house. When we rent or buy a home, we are paying for a bundle of house accommodations for the sake of health, comfort, education and efficiency. How much house accommodation do we get and how much do we pay for each unit of it?

This even is a complicated unit. It consists of many factors, and no two investigators attach the same weight to each of the factors. But this difficulty is exactly the one that has been met in another field, by breeders' associations and by produce exchanges, in standardizing and grading agricultural products, such as wheat, corn, butter, horses, cows and pigs. An ideal horse, for example, perfect in every particular, is represented by 100 points. The horse is mapped off and described by 36 specifications, and each specification is given a weight or value, corresponding to its importance in making up the perfect animal. Thus "general appearance" gets 29 points, composed of 5 points for "weight," 4 for "form," 6 for "quality," and so on. These standard weights, or values, are printed in a column opposite each specification, and a second or blank column is provided under the caption "Points Deficient." In using the score card, the "valuer" goes over the horse, noticing in detail all the points specified, and then marks down opposite each his judgment of the degree to which the animal before him is deficient in that particular point. The total of all points deficient is then deducted from 100, and the result is the grade of the animal scored.

In attempting to adopt this method I have drawn up the following score card for dwelling houses. The weights, or "values" given to each of the 35 specifications are of course tentative, and can be made precise only after a large body of evidence is assembled and experts have passed upon them. But precision

at this point is not important. The main object is the specifications themselves. If all investigators use the same specifications, any person afterwards can change the weights to suit his own theories or his knowledge of the facts.

The accuracy of the method consists in the fact that it limits the total margin of error by breaking it up into 30 or 40 little margins. Where measurements are possible, but little discretion need be left to the individual. This appears in the case of "window openings." Where measurements are not possible, the agents must depend on their judgment, but this judgment can be brought close to uniformity by "instructions for discrediting when depending on judgment." For convenience I have used only the weights 3 and 6 for those specifications depending on judgment, and have introduced the same kind of instructions as those given in the official score cards of breeders' associations for horses and cattle. These and other instructions will be found at the proper points on the score-card.

When a house is "scored" according to this card, we shall have the "total points deficient," and the "actual score" of that house compared with a perfect or ideal house. We are then in a position to compare the rents or cost of housing by correcting the "nominal rent" by means of the "actual score." I have suggested three standard units of comparison, as will be seen on the card, viz., "rent per room," "rent per 100 sq. ft." of floor space, and "rent per 1,000 cu. ft." of air capacity. Taking "rent per 100 sq. ft.," which is probably the fairest unit under all circumstances, it can easily be seen that, of two houses renting nominally at \$1.00 per month for equal floor space, if the "actual score" of one is 80 and the other 50, the "real rent" of the one is \$1.25 and the other \$2.00 for the unit of house accommodation compared with the real rent of \$1.00 for a perfect house.

DWELLING HOUSE SCORE CARD.

Applies to a single Family or Household.

State.....City.....Street.....No.....

Name of owner.....Name of Occupant.....

Name of Investigator.....Date.....

Instructions for Discrediting when Depending on Judgment

Deduct from possible 6: very slight, 1; slight, 2; marked, 3; very marked, 4; extreme, 5.

Deduct from possible 3; very slight, $\frac{1}{2}$; slight, 1; marked, $1\frac{1}{2}$; very marked, 2; extreme, $2\frac{1}{2}$.

1.—DWELLING—100 POINTS		Possible Score	Points Deficient	Actual Score
LOCATION—18 Points		(18)	()	()
1. General Character of Neighborhood, villa, farm, residence, park, (Discredit for factory, slum, neglected district)		3	.....	.....
2. Elevation, high ground, sloping away on all sides		3	.....	.....
3. Condition of Street, width (ft.)....., clean, smooth, hard, free from dust, sprinkled, flushed, free from refuse		3	.....	.....
(Indicate whether asphalt, block stone, macadam, cobble, wood, dirt)				
4. Smoke, free from (indicate source)		3	.....	.....
5. Odors, free from nauseous (indicate source)		3	.....	.....
6. Dust, free from (indicate source)		3	.....	.....
CONGESTION OF BUILDINGS—26 Points		(26)	()	()
7. Character of Dwelling—10 Points		10		
Detached				
Attached, separate entrance, discredit 1 point				
Attached, common entrance, discredit 2 points				
Flat (entire floor), discredit 3 points				
Apartment (2 or more on same floor), discredit 4 points				
Basement (over $\frac{1}{2}$ above street level), discredit 5 points				
Cellar (over $\frac{1}{2}$ below street level), discredit 6 points				
Additional discredits for flat or apartment without elevator, 2nd floor 2 points, 3rd floor 3 points, etc.				
8. Sunlight—16 Points				
Height and distance of next building (use foot of its own window in case of flat or apartment, otherwise foot of lower window, as base line above which to measure height of next building)				
Direction	Height	Distance	Per Cent	
(Ind. street or alley)	(feet)	(feet)	(Height=100)	
North	.....	.....	.....	3
South	.....	.....	.....	5
East	.....	.....	.....	4
West	.....	.....	.....	4
(If distance equals or exceeds height, no points deficient—if distance is less than height, actual score is same per cent of possible score as distance to height, e. g. if distance=20% of height, actual score=20% of possible score, etc.)				
WINDOW OPENINGS—11 Points		(11)	()	()
Rooms	Window Space	Floor Space	Per Cent	
(Indicate kitchen, sleeping, bath, etc)	(Sq. Ft.)	(Sq. Ft.)	Window Space (Floor space-100)	
1.....	.....	.....	.....
2.....	.....	.....	.....
3.....	.....	.....	.....
4.....	.....	.....	.....
5.....	.....	.....	.....
6.....	.....	.....	.....
Number of Rooms (including Dark Rooms) having window space less than 20%				
Per Cent of same to total rooms				
Number of Dark Rooms				
Per Cent of same to total rooms				

DWELLING HOUSE SCORE CARD—Continued.

I.—DWELLING.—100 POINTS.	Possible Score	Points Deficient	Actual Score
9. Total Window Space, not less than 20% of total floor space (Discredit $\frac{1}{4}$ point for each deficiency of 1%—e. g., window space 16% of floor space, discredit 1 point, leaving actual score 4)	5	.....	.....
Distribution of Window Space—6 Points			
10. Deficient Rooms, no room less than 20%..... (Discredit same per cent of possible score as per cent of rooms having window space less 20%, e. g., 6 room house, 2 rooms deficient, discredit $\frac{1}{3}$ of 3 = 1, leaving actual score 2)	3	.....	.....
11. Dark Rooms, no room without window openings..... (Discredit same per cent of possible score as per cent of dark rooms, e. g. 6 room house, 1 dark room, discredit, $\frac{1}{3}$ of 3 = $\frac{1}{2}$ leaving actual score 2 $\frac{1}{2}$)	3	.....	.....
Notice: dark room is discredited also above as "deficient room"			
AIR AND VENTILATION—13 Points	(13)	()	()
12. Heating Arrangements, adapted to secure circulation of fresh air such as open fire place, hot air furnace, stove (connecting directly with chimney in same room)..... (Discredit 1 point for steam or hot water, $\frac{1}{2}$ point for each stove connecting with chimney in another room)	4	.....	.....
13. Temperature, adapted to secure even temperature, not excessive heat or cold, equal in different rooms..... (Discredit proportionately for each room without heating appliance)	3	.....	.....
14. Dampness, freedom from (indicate whether cellar, kitchen, sleeping rooms, other rooms).....	6	.....	.....
STRUCTURAL CONDITION—6 Points	(6)		
15. Material, (Indicate whether wood, brick, stone, concrete no decayed wood, walls, floors, ceilings in good condition (Discredit $\frac{1}{2}$ point for papered walls or ceilings)	3	.....	.....
16. Size of Rooms, height of ceiling, not less than 9 feet..... (Discredit $\frac{1}{4}$ point for each foot deficient)	1	.....	.....
17. Floor Space, (no room less than 120 sq. ft.)..... (Discredit proportionately for each room less than 120 sq. ft.)	2	.....	.....
HOUSE APPURTENANCES—26 Points	(26)	()	()
(Discredit total score in each case if appurtenance is not provided)			
18. Bath, (Discredit 2 points for bath used in common).....	4	.....	.....
19. Closet in Dwelling..... (Discredit 1 point for closet used in common, 2 for outhouse with sewer connection, 3 without sewer)	4	.....	.....
20. Sink, (Discredit $\frac{1}{2}$ for sink used in common).....	1	.....	.....
21. Laundry, (Discredit $\frac{1}{2}$ for common laundry).....	1	.....	.....
22. Running Water in house, (Discredit 1 point for common hydrant, 2 for hydrant outside, 3 for well outside).....	4	.....	.....
23. Condition of Appurtenances, good material and workmanship, all pipes exposed.....	6	.....	.....
24. Quality of Water for Drinking.....	3	.....	.....
25. Quality of Water for Bath and Laundry.....	3	.....	.....
DWELLING TOTAL	100		

COST OF HOUSING

Rent per month \$.....	Rental value (if occupied by owner) \$.....	
Unit of Comparison	Nominal Rent	Real Rent
Rent per room.....	\$.....	\$.....
Rent per 100 sq. ft.....	\$.....	\$.....
Rent per 1,000 cu. ft.....	\$.....	\$.....
Probable income of family per month \$.....		

The foregoing applies solely to the house itself, or to the landlord as responsible for the house. But the conditions of health and the cost of housing are modified by the habits and circumstances of the occupants. These should be separated from the other problem by means of a separate score card. Here the prob-

lem of "congestion of occupancy" is paramount, and the unit of comparison is the "rent per occupant." The actual score on the "occupant" card becomes a coefficient of the actual score on the "dwelling" card, and this combined score gives the grading of the unit of housing accommodation as provided by the landlord and modified by the tenant. If, for example, two houses are scored 80 and 50 respectively on the "dwelling" card, and the occupants of each are scored alike at 70 on the "occupant" card, the combined dwelling and occupant scores are 56 and 35 respectively. If, then, the nominal rent is \$2.00 per occupant, the real rents are \$3.57 and \$5.71 per occupant, compared with \$2.00 for the ideal dwelling occupied by the ideal tenant.

DWELLING HOUSE SCORE CARD.

II.—OCCUPANTS—100 POINTS	Possible Score	Points Deficient	Actual Score
CONGESTION OF OCCUPANCY—61 Points	(61)	()	()
Occupants, number			
Family, 10 years old and over, male			
female			
Lodgers, Domestic, 10 years old and over, male			
female			
Children under 10 years			
Total (Child under 10 as ½ person)			
1. Cubic Air Space, (average height of ceiling by total floor space), cu. ft.			
Cu. ft. per occupant	50		
(Discredit 1 point for each 20 ft. below 1000, e.g., 600 cu. ft. discredit 20 points, leaving actual score 30)			
2. Sleeping Rooms per occupant	11		
(Discredit 1 point for each person in excess of number of sleeping rooms)			
CONDITION OF AIR AND VENTILATION—18 Points	(18)	()	()
3. Windows, kept open to fresh air			
Living rooms	3		
Sleeping rooms	6		
4. Temperature, kept even, not excessive heat or cold	3		
5. Dust, care in avoiding dust by sweeping, no home workshop	6		
CLEANLINESS, care and attention, no rubbish, dirt, grease or refuse,—21 Points	(21)	()	()
6. Hallways	3		
7. Floors	3		
8. Walls	3		
9. Plumbing	6		
10. Yard	6		
OCCUPANTS TOTAL	100		
Rent per occupant, nominal	\$		
Real rent per occupant (compared with standard)	\$		

I wish to call attention to the pedagogical value of the score card as the basis of practical instruction in economics and sociology. This value has been conclusively demonstrated in our agricultural colleges, where the students begin their studies by using it on animals and cereals. It develops the student in his ideals of perfection, his accuracy of observation and his power of judgment. These are the great essentials of scientific education and they have been admirably stated by Mr. Craig

in his book, *Judging Live Stock*. He says, "to formulate an ideal is absolutely essential, and in doing this it is imperative to familiarize one's self with the good qualities of animal life, correct conformation and the highest types, so that the least variation from these at once attracts the attention. When a distinct ideal, based on the best types and their highest qualities, has been formed in the mind, and this is supported by a discriminating eye, it is but another step to render a correct judgment."

What Mr. Craig says of agricultural education is true also of sociological education. The score card directs attention to details often overlooked. It requires consideration of their meaning and significance. It sets up standards of precise observation in place of vague or sentimental impressions of things in general. When perfected it will go far towards giving to Home Economics the character of a true science.

THE BEGINNING OF EDUCATION IN AGRICULTURE AND HOME ECONOMICS IN NORTH AMERICA.

Apparently agricultural education in North America had its beginning in the farm school which was established by Francois de Laval, the first bishop of Canada, in 1668 or about that date.

Parkman^a in one of his volumes on the early history of Canada, states that in 1647, which was only a few years after the founding of Harvard, the oldest college on the continent, Laval, with the approbation of Louis XIV, founded his seminary at Quebec for the training of priests. This seminary still exists as a part of the university afterwards established in honor of Laval. The Jesuit College, like the Church of Notre Dame of about the same date, was built of stone. It was begun in 1647 and the walls and roof were finished in 1649. The interior of the building was burned in 1701, much property being lost.

Extending his educational system, Laval established in 1668 the Lesser Seminary where boys were educated in hope that they would one day take orders. This school began its work in a dwelling house with eight French and six Indian pupils. He also established at this time a kind of farm school, which was attached to the seminary, for the training of the humbler class of pupils. This school was located at the Parish of St. Joachim, below

^aThe Old Regime in Canada. Boston, 1895. pp. 212, 289, 347, 409, 411, 412, 414, 434 438.

Quebec. Of the site selected Parkman writes, "From the vast meadows of the Parish of St. Joachim, that here border the St. Lawrence, there rises like an island a low flat hill, hedged round with forests like the tonsured head of a monk. It was here that Laval planted his school." At this school, according to Parkman "the children of artisans and peasants were taught farming and various mechanical arts and thoroughly grounded in the doctrines and discipline of the church^a."

In another place Parkman says "It was a sort of farm school, though besides farming various mechanical trades were also taught in it. It was well adapted to the wants of a great majority of Canadians, whose tendencies were anything but bookish. . . . Besides manual training, the pupils were taught to read and write; and for a time a certain number of them received some instruction in Latin. When, in 1686, Saint-Vallier visited the school, he found in all thirty-one boys under the charge of two priests; but the number was afterwards greatly reduced, and the place served, as it still serves [1893], chiefly as a retreat during vacations for the priests and pupils of the seminary of Quebec. A spot better suited for such a purpose cannot be conceived."

Parkman also says "Judging from repeated complaints of governors and intendants of the dearth of skilled workmen, the priests in charge of it were more successful in making good Catholics than in making good masons, carpenters, blacksmiths, and weavers; and the number of pupils, even if well trained, was at no time sufficient to meet the wants of the colony; for, though the Canadians showed an aptitude for mechanical trades, they preferred above all things the savage liberty of the backwoods." Parkman states on the authority of La Tour^b that most of the pupils trained at the industrial school were retained after leaving it by the seminary as servants, farmers, or vassals.

According to a letter written in 1668 which Parkman quotes, the king also maintained a teacher of navigation and surveying at Quebec on the modest salary of four hundred francs per year,

While Laval was founding educational institutions for boys, the problem of educating girls was being taken up by the Ursulines and the Nuns of the Congregation at Quebec. As most of the

^aAnnales du Petit Seminaire de Quebec, see *Abeille*, Vol. 1; Notice Historique sur le Petit Seminaire de Quebec, *Ibid.*, Vol. 11; Notice Historique sur la Paroisse de St. Joachim, *Ibid.*, Vol. 1. The *Abeille* is a journal published by the seminary.

^bVie de Laval, VI.

secular teaching was along the lines of manual training and what is now grouped under the head of Home Economics; it may be truthfully said that formal education in this subject had its beginning in North America at the Convents in Quebec about the middle of the seventeenth century. In a letter dated August 9, 1668, it is stated that the Ursulines besides careful instruction in religious duties, taught all that a girl ought to know. "This meant exceedingly little besides the manual arts suited to their sex; and, in the case of the Nuns of the Congregation, who taught girls of the poorer class, it meant still less. It was on nuns as well as on priests that the charge fell, not only of spiritual and mental, but also of industrial training. Thus we find the king giving to a sisterhood of Montreal a thousand francs to buy wool, and a thousand more for teaching girls to knit."

The training which the girls received must have been very largely in household tasks, for spinning and weaving seem to have been very unusual until a much later date. The intendant Champigny made great efforts to induce the farmers to raise flax and hemp and begged that weavers be sent out to teach the women and girls how to weave and spin. These arts and the cultivation of hemp and flax were neglected, Parkman states, until 1705, "when the loss of a ship laden with goods for the colony gave the spur to home industry; and Madame de Repentigny set the example of making a kind of coarse blanket of nettle and linden bark. . . ."

"Of the arts of ornaments not much could have been expected; but, strangely enough, they were in somewhat better condition than the useful arts. The nuns of the Hotel-Dieu made artificial flowers for altars and shrines, . . . and the boys of the seminary were taught to make carvings in wood for the decoration of churches."

HIGHER EDUCATION IN HOME ECONOMICS IN IRELAND.

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For several years past the Department of Agriculture and Technical Instruction for Ireland has been seeking to encourage the introduction of Home Economics teaching into the educational system in Ireland, where there is a growing conviction that the education of girls may, without any sacrifice of culture, concern itself more closely with the daily needs of their future life. With this end in view the teaching of domestic subjects under the committees in charge of the county work has been rapidly developed and has proved very popular. In many girls' secondary schools a course in Domestic Economy is now offered, based on a syllabus prepared by the department, and co-ordinate with the work in physics, chemistry and other science teaching.

There are also eight Schools of Rural Domestic Economy under the management of the department. Most of these are held at convents in convenient localities, but are open to girls over sixteen years of age without restriction as to religion. A year's course of study is provided which is intended to qualify the pupils to perform efficiently the work of rural life. It includes in most cases dairying, poultry keeping, horticulture, household management, cookery, laundry work and needlework, and is open to applicants upon passing an examination in the elements of arithmetic and English and producing certificates of good health and character. Both resident and day pupils are admitted to most of the schools, and those at Loughlynn and Killeshandra make special provision for housewives and others unable to attend regularly. Somewhat similar courses are also offered at the Munster Institute, Cork, and the Ulster Dairy School, Cookstown, a brief account of which has already been given in the October number of the JOURNAL.

Although a large amount of good is being accomplished through these courses, they are distinctly secondary in scope and the time allowed is very limited, so that a need of more specialized teaching has been felt. To meet this need, it was decided to

establish residential schools for girls who had already received a good general secondary education, and to offer at these schools systematic instruction in housewifery.

The initial plan contemplated two such schools, one in the north and the other in the south of Ireland. After some negotiation the nuns of the Ursuline Convent of Waterford undertook the school for the south and this has now been in very successful operation for about four years.

The establishment of the school for the north was delayed owing to difficulty in finding a suitable location, but eventually it was opened on October 13, 1908, at Londonderry, in connection with the Victoria High School.

The school, which is known as the Northlands School of Housewifery, occupies a building specially erected for the purpose and equipped as an ordinary dwelling house, approximating as closely as possible to the actual conditions of home life. It is situated on high and open ground near the Victoria High School. Nearly all its rooms command beautiful views, and all are light, airy and spacious. One of the class-rooms is shown facing page 32.

The course of study at Northlands is somewhat unique in that it combines the daily, continuous work of a real household with the formal classroom instruction. The students undertake in rotation the cleaning of rooms, staircases, kitchen range, etc., the preparation of the kitchen and laundry for classes, marketing, and the preparation of meals. At the end of the course each student is given a practical test in which she is made responsible during a given time for the entire management of the house, including the planning of meals, the organization of the work of the servants, the keeping of the accounts, and similar details.

The class-room instruction covers an average of $17\frac{1}{4}$ hours per week, of which 6 hours are devoted to cookery, 2 hours to laundry work, 4 hours to needle work, dress-making, upholstery, etc., $3\frac{3}{4}$ hours to housewifery, and $1\frac{1}{2}$ hours to the preparation of notes and extra needlework. It is expected that this will occupy the full time of the students, but the work is so arranged that if desired some subject of art or literature may be substituted for a portion of the course. There is also a combined course in which students may proceed with the usual educational subjects

at the Victoria High School. A diploma is given at the completion of the Northlands course.

Such has been the success attained at this school and also at that at Waterford that there has been a strong demand for a third institution of like grade, and this has been met by the adoption of a similar curriculum by the Ursuline Convent at St. Joseph's, Sligo. This is a large and well-established residential secondary school, which had already carried on the course in Domestic Science outlined by the Department of Agriculture and Technical Instruction with conspicuous success. Special attention had been given to the matter of equipment, and the convent authorities had provided a well-equipped and modern laundry, kitchen, dairy, poultry yard, etc. Electric power had been installed throughout and there is a producer gas plant, gas engine and dynamo in charge of one of the Sisters. This equipment was immediately available for use in more specialized instruction in Domestic Economy and the department adopted the proposal to aid and recognize the instruction given. This includes not only cookery, laundry work, housewifery and dressmaking, but also dairying, poultry keeping, and some instruction in the laws of health, literature and other more or less directly utilitarian studies. A view of the kitchen of the school is shown facing page 32.

Reference should also be made in this article to the summer courses for teachers in Ireland. These are also held under the direction of the Department of Agriculture and Technical Instruction, chiefly as a means of training teachers now in the service. The courses were begun in 1901 and have since been continued without interruption. They are held at the Royal College of Science, the Metropolitan School of Art, other central institutions administered by the department, numerous convents, and elsewhere. The curriculum extends over about one month and includes general experimental science, manual training, school gardening, drawing and modelling, and related topics, but special courses are offered in rural economy, revival of Irish industries, and Domestic Economy. The Domestic Economy course embraces cookery, elements of physiology and hygiene, sewing, embroidery, dressmaking, lace making, crotchet work, and sprigging. In 1909, 12 courses related to Domestic Economy were held at 9 institutions with a total attendance of 132 students.



INSTRUCTION IN COOKERY AT URSULINE CONVENT, ST. JOSEPH'S, SLIGO, IRELAND.



A CLASS-ROOM, NORTHLANDS (IRELAND) SCHOOL OF HOUSEWIFERY.

PROGRESS IN NUTRITION, 1908-9^a

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Such a paper as has been prepared must of necessity be selective as regards material included, and it has been the purpose to select representative material which shows in a general way the progress which is being made in various lines of the general subject of nutrition and to give preference to American work rather than to that of other countries, as we are naturally particularly interested in the progress which is being made in the United States and Canada.

As regards the period covered, it has been the purpose to take up the subject where it was left by the paper presented at the Chautauqua meeting of the Lake Placid Conference in 1908 and carry it to the close of the year, 1909.

The material has been arranged under certain general headings, such as studies of the composition of foods and character of the principal food constituents, dietary studies and dietary standards and school luncheons and the feeding of children.

The question of pure food legislation and the use of preservatives and similar topics constitute special subjects on which so much has been published that they deserve an independent summary. Therefore, no attempt will be made to review work in these lines. The same may be said of statistical data regarding the production and marketing of food, the proportion of the family income expended for food, and the relative cost of food at the present time as compared with other years. The subject of milk and other dairy products and that of infant feeding are also questions which merit independent summaries, and, so, brief reference will be made to only a few investigations along such lines.

ANALYSIS AND SPECIAL STUDIES OF THE COMPOSITION OF FOOD.

Methods of analysis as usual have received a great deal of attention. Albahary (Compt. Rend. Acad. Sci. [Paris], 146 (1908), No. 7, pp. 336-338) proposes a more detailed scheme than that usually followed for the proximate analysis of vegetable products.

In connection with methods of examination and analysis men-

^aPresented before the Boston Convention of the American Home Economics Association, January 1, 1910.

tion should be made of the work of Howard on the use of the microscope for the detection of food adulteration which was summarized in the Department of Agriculture Yearbook (U. S. Dept. Agr. Yearbook, 1907, pp. 379-384, pls. 4).

Briggs of the Bureau of Plant Industry of the Department has reported (U. S. Dept. Agr., Bur. Plant Indus. Circ. 20, pp. 8, figs. 3), an interesting method for determining the moisture content of grain which depends upon variations in electrical resistance. In experiments with wheat it was found that this factor was 50 times greater in wheat containing 13 per cent of moisture than in wheat containing 15 per cent. An advantage claimed for this method is its rapidity, the individual determinations requiring only two or three minutes.

In a paper on the determination of carbon by means of the bomb calorimeter, Fries (Jour. Amer. Chem. Soc., 31 (1909), No. 2, pp. 272-278, fig. 1) concludes that carbon dioxide may be determined with great accuracy by a modification of the Atwater Berthelot bomb, and also reports data which indicate that the bomb may be used equally well for the determination of hydrogen.

Much contention has always existed as to the terminology of nitrogenous constituents of foods, foodstuffs, and other materials, so particular interest attaches to the report of the joint committee of physiologists and biochemists on this matter (Science, N. S., 27 (1908), pp. 554-556). The principal recommendation is that the word "proteid" be abandoned and that "protein" be used to designate substances which consist so far as is known at present essentially of combinations of α -amino acids and their derivatives.

In connection with studies of many nutrition problems analytical data have accumulated to a considerable amount but no attempt is made to summarize such incidental analyses here. Of special analytical studies the following may be mentioned:

Many analyses, particularly of tropical fruits were reported by Merrill of the Maine Experiment Station, (Maine Sta. Bul. 158, pp. 219-238), together with studies of the digestibility of hulled corn, the values obtained being low in comparison with white bread.

As part of a study of breakfast foods Frear of the Pennsylvania State College (Penn. Dept. Agr. Bul. 162, pp. 40), has examined these goods with reference to the alleged occasional presence of materials such as morphin and strychnin with negative results, a

matter which is of interest in connection with the persistence of popular statements to the effect that cereal breakfast foods sometimes contain such materials, a statement apparently without any foundation of fact.

In *History, Manufacture and Analysis of Maple Products*, Sy (Jour. Franklin Inst., 166 (1908), pp. 249-280; abs. in Chem. Abs., 2 (1908), No. 24, p. 3376) summarizes a large amount of historical, botanical, and chemical data and reports the analysis of maple products and experimental work carried on in an attempt to isolate flavoring substances present in sap.

Van Dine and Miss Alice R. Thompson (Hawaii Sta. Bul. 17, pp. 7-21, pl. 1) have reported an extended and interesting study of Hawaiian honeys, a number of which consist chiefly or entirely of honey-dew which the bees collect instead of plant nectar after it has been exuded by insects.

The amount of extractive material in light and dark meat was studied by Adler (Berlin. Klin. Wchnschr., 45 (1908), No. 8, pp. 393-396) with beef, veal, pork, chickens, and fish (raw and cooked). The results obtained led Adler to conclude that sufficient differences existed in the amount of nitrogenous extractives present in beef and veal to justify the classification into "red" and "white" meat. In the case of white meats, he found that boiling removed more extractive nitrogen than roasting. The results he obtained were discussed with special reference to invalid dietetics.

Several extended investigations have been reported of the chemical composition of fish. Reuss (Ber. K. Bayer. Biol. Vers. Stat. Munchen, vol. 1, pp. 185-220; abs. in Chem. Zentbl., 1908, I, No. 12, p. 1193) considered, in this connection, the effect of growth and environment and included lecithin and calcium in his analytical work, in addition to the usual proximate constituents. According to his results, the water in which the fish live has an effect upon their growth and nutrition.

Milroy (Ann. Rpt. Fishery, Bd. Scot., 24 (1905), pt. 3, pp. 83-107; 25 (1906), pt. 3, pp. 197-208; Bio-Chem. Jour., 3 (1908), Nos. 6-8, pp. 366-390) has reported a very extended series of analytical studies of herring taken on different parts of the Scotch coast and has discussed his results with reference to changes which the herring undergo before, during, and after the spawning period. Phosphoric acid and in some cases the coagulable muscle proteins were determined in addition to the proximate conditions.

A large amount of data was summarized and discussed by J. König and A. Splittgerber (*Landw. Jahrb.*, 38 (1909), Sup. 4, pp. 1-169, pls. 6; *Ztschr. Untersuch. Nahr. u. Genussmtl.*, 18 (1909), No. 9, pp. 497-537, fig. 1) regarding the storing, curing, and preservation of fish, the composition, nutritive value, and importance as food of fish and fish products, together with analyses of such materials, which include in some cases a number of constituents in addition to the usual proximate constituents. In several instances elementary analyses were also made. In general, the authors conclude that fish flesh is as easily and well digested as meat and that it may constitute a very important source of nutritive material. Under German conditions the authors believe that sea fish must be selected rather than fresh-water fish if it is desirable to lower the cost of the diet by using fish flesh in place of meat. As a whole, the article constitutes an exhaustive study, more particularly with reference to German conditions, of the value of fish as food from the standpoint of commercial importance, economy, and nutritive value, as shown by chemical composition.

The question of oysters, particularly their water content and the presence of copper, has also been studied in connection with the work of the Indiana State Board of Health (*Mo. Bul. Ind. Bd. Health*, 10 (1908), No. 11, pp. 134-136, fig. 1).

Rivière and Bailhache have studied the influence of direct light on the chemical composition of fruits and found (*Jour. Soc. Nat. Hort. France*, 4. ser., 9 (1908), Nov., pp. 627-630) that the side of pears exposed to the sun showed a greater sugar content and a lesser acid content than the unexposed side. Similar results were obtained with grapes.

Prinsen Geerligs (*K. Akad. Wetensch. Amsterdam Proc. Sect. Sci.*, 11 (1908), pp. 74-84; abs. in *Jour. Chem. Soc. [London]*, 94 (1908), No. 553, II, p. 977) has studied the varied changes in composition of mangoes, tamarinds, bananas, and sapodillas during ripening.

Kayser (*Ztschr. Öffentl. Chem.*, 15 (1909), No. 10, pp. 187-188) reports that the principal acid constituent of pineapple juice is citric acid. Tartaric and malic acid were not found. Apparently, citric acid is much more widely distributed in fruit juices than has been supposed. Scuppernong, Concord, and Catawba grape juice was studied by Gore of the Bureau of Chemistry (*Jour. Indus. and Engin. Chem.* 1 (1909), p. 436).

Vinson of the Arizona Experiment Station has continued his important studies of the ripening of fruits, particularly dates, and finds that ripening may be so stimulated in this fruit by exposure to acetic acid fumes that dates may be shipped green and then ripened where sold, a matter of much importance as the fresh ripe date is so soft it will not bear shipment. Involved in his work is an extended study of date constituents and date chemistry (*Science*, n. s., 30 (1909), p. 604).

Eggs.—Lewin, Miethe, and Stenger (*Arch. Physiol.* [Pflüger], 124 (1908), pp. 585-590; abs. in *Jour. Chem. Soc.* [London], 94 (1908), No. 554, II, p. 1054) studied the coloring matter of egg yolk by means of the spectroscope and found characteristic bands. The fat of hens' eggs has been studied by Paladino (*Biochem. Ztschr.*, 17 (1909), No. 4, pp. 356-360), and the lecithin of the egg yolk by MacLean (*Ztschr. Physiol. Chem.*, 59 (1909), Nos. 3-4, pp. 223-229). Plimmer has studied the proteids of egg yolk (*Jour. Chem. Soc.* [London], 93 (1908), No. 550, I, pp. 1500-1506) and Worms (*Zhur. Russ. Fiz. Khim. Obshch.*, 38 (1906), pp. 597-607; abs. in *Ztschr. Untersuch. Nahr. u. Genussmtl.* 16 (1908), No. 6, pp. 363, 364), the albumen of turkey egg white.

The infection and preservation of eggs was studied by Lamson, Jr. (*Connecticut Storrs Sta. Bul.* 55, pp. 203-214, figs. 7) of the Connecticut Storrs Experiment Station.

In a bulletin entitled *The Egg Trade of the United States*, Hastings (*U. S. Dept. Agr., Bur. Anim. Indus. Circ.* 140, pp. 34) discusses eggs from the standpoint of the dealer as well as the consumer and such questions are considered as quality in eggs; grade of eggs; detrimental changes in eggs; and consequent losses; the consumers' position; methods of marketing eggs; storage and preservation of eggs.

The collection, use and characteristics of penguin eggs, which are used to a considerable extent in South Africa have been described in a popular article. (*Sci. Amer. Sup.*, 66 (1908), No. 1716, p. 330).

Aufrecht and Simon (*Deut. Med. Wchnschr.*, 34 (1908), No. 53, pp. 2308-2310), from the results of a single digestion experiment with a healthy man in which raw and soft boiled eggs were eaten in comparison with meat as a part of a simple mixed diet, conclude that the raw eggs have the higher digestibility and nutritive value. In this connection it may be said that the differences observed are well within variations found in digestion work and

that circumstances would seem to warrant the conclusion simply that eggs eaten in both ways are well assimilated.

J. T. Willard and R. H. Shaw (Kansas Sta. Bul. 159) report analyses of a large number of eggs and give data regarding the thickness of the shell and the percentage of phosphoric acid in the ash of the yolk. The ash consists quite largely of this constituent doubtless derived almost entirely from the egg yolk lecithin.

Meat and Meat Products.—Trowbridge and his associates, of the Department of Agricultural Chemistry of the University of Missouri, have studied the determination of phosphorus in flesh (Jour. Indus. and Engin. Chem., 1 (1909), p. 675), changes in the composition of the skeleton of beef animals (Ibid. p. 725), and the composition of the fat of beef animals on different planes of nutrition (Ibid, p. 761).

Grindley and his associates, of the University of Illinois, have reported extended work on the chemistry of flesh, raw and cooked, with reference to the effects of cold storage, both beef and poultry being used (Jour. Indus. and Engin. Chem., 1 (1909), pp. 413, 580. The results are reported in detail and it is difficult to summarize them in short space. In brief, an increase was noted during storage in the soluble dry matter, nitrogenous, non-nitrogenous, and total organic extractives, total soluble nitrogen and soluble inorganic phosphorus, the differences being greater with long than with short periods of storage.

W. Koch has summarized data on phosphorus compounds as brain foods (Jour. Amer. Med. Assoc., 52 (1909), pp. 1381-1383), and presents data on the composition of normal and diseased brain. He concludes that phosphorus is amply supplied for the growth of the brain by the ordinary daily food. If desired, the phosphorus constituents of the diet may be readily increased by adding such materials as eggs, sweetbread, liver, and some meats. He does not recommend the use of commercial phosphorus preparations.

Meat extracts and yeast extracts.—The origin, manufacture, and uses of meat extract, particularly the Argentine meat extract industry have been described in the London Lancet (Lancet [London], 1908, II, No. 17, pp. 1233-1244, figs. 8, dgm. 1, maps 3).

Many studies have been made of meat extract, particularly concerning the character of the so-called meat bases which it contains. As an illustration may be mentioned Kutscher's work. (Zentbl. Physiol., 21 (1907), No. 18, pp. 586, 587).

One of the most important contributions to the subject of meat extract is that by Bigelow and Cook entitled *Meat Extracts and Similar Preparations Including Studies of the Methods of Analysis Employed* (U. S. Dept. Agr. Bur. Chem. Bul. 114), which reports the results of the analysis of a large number of commercial goods of this character, discusses the composition, food value, and uses of such goods, methods of manufacture and many other questions, and is a digest of useful data regarding this class of food products.

Street and his associates report from the Connecticut State Experiment Station (Connecticut State Sta. Rpt. 1907-8, pt. 9, pp. 573-716), an exhaustive study of meat extracts and similar goods, of the same general character as the work of the Bureau of Chemistry, and a very important and useful summary of data and report of analytical work. Yeast extracts are included as well as meat extracts.

The question of yeast extracts has also been discussed by Gamgee (Brit. Med. Jour., 1908, No. 2486, pp. 449-453) and Chapman (Brit. Med. Jour., 1908, No. 2502, pp. 1741-1743).

Milk and Dairy Products.—As already noted, the subject of milk, butter, cream, dairy products, and dairying is so large that it deserves an independent summary. Students of nutrition will perhaps be specially interested in experiment station tests of milking machines as it is believed that these may result in a cleaner milk supply. The problem has been studied by Hæcker and Little of the Nebraska Station (Nebraska Sta. Bul. 108, pp. 3-73, pl. 1, figs. 4) and many others.

McGill of the Inland Revenue Department of Canada has published (Lab. Inland Rev. Dept. Canada Bul. 185, pp. 15) a bulletin on infant's and invalid's foods which contains a good deal of data regarding the chemical composition of proprietary articles of this sort.

Melick of the Maryland Experiment Station has reported (Maryland Sta. Bul. 136, pp. 285-300), the result of an extended series of experiments on the factors which influence the whipping of cream, while Michels of the North Carolina Experiment Station supplies (North Carolina Sta. Bul. 202, pp. 5-11, figs. 3) a large amount of data regarding the manufacture of cottage cheese and skimmilk-butter milk, so much sold at the present time under the title of "buttermilk," but which it is said is made by churning sour skim milk so that the curd is finely broken and evenly distributed throughout the whey.

The Use of Milk as Food, a Farmers' Bulletin of which R. D. Milner is the author (U. S. Dept. Agr. Farmers' Bul. 363), summarizes and discusses data on the composition, digestibility and food value of milk and milk products, the use of these materials in the home and other related topics.

Fats and Oils.—With reference to the assimilation of animal and vegetable fat by man, Gerlach (Ztschr. Diatet. u. Phys. Ther., 12 (1907), p. 102; abs. in Biochem. Centbl., 7 (1908), No. 13, pp. 497, 498), reaches the conclusion that there are no differences in this respect. He experimented with butter and a commercial butter substitute prepared from cocoanut fat.

Levites has also studied the digestion of fat in the animal body, using egg-yolk fat, olive oil and other fats. Experiments were made with dogs, and according to him, when fat is fed either alone or mixed with other foodstuffs only a very small quantity is saponified in the stomach. (Biochem. Ztschr., 20 (1909), Nos. 3-5, pp. 220-223).

Leathes' paper on the functions of the liver in relation to the metabolism of fats is an important contribution (Lancet [London] 1909, I, No. 9, pp. 593-599) to the physiology of fat digestion.

Olive oil and cooking oils, which latter are usually refined cotton-seed oils, are discussed by Allen and Hill of the North Carolina Department of Agriculture, (Bul. N. C. Dept. Agr., 29 (1908), No. 12, pp. 80). Apparently, olive oil is not adulterated at present, while cotton-seed oils used for cookery are seldom adulterated. The authors conclude "that some of the cooking oils are very desirable for culinary purposes."

In connection with the subject of oils, it is interesting to mention that considerable work has been done regarding the effect of rancid oil on the destruction of red blood corpuscles. It appears from the data reported that the free fatty acid has a marked effect of this character. Among the workers in this field have been Moore, Wilson and Hutchinson (Jour. Physiol., 38 (1909) No. 5, pp. lxxiii-lxxiv).

Tea, Coffee and Chocolate.—Togami (Biochem. Ztschr., 9 (1908) Nos. 5-6, pp. 453-462) has studied the effects of tea, coffee and chocolate and draws the general conclusion that when of ordinary strength the beverages exercise no harmful effect upon digestive ferments. If, however, the infusions are very strong, the reverse may be the case, as was shown by tests with tea.

Fauvel (*Compt. Rend. Soc. Biol. [Paris]*, 64 (1908), No. 17, pp. 854-856, dgm. 1), has found that both coffee and chocolate increased markedly the purins in the urine but notably diminished the uric acid without at the same time causing a retention of this acid in the body.

The aroma of black tea, according to Katayama (*Bul. Imp. Cent. Agr. Expt. Sta. Japan*, 1 (1907), No. 2, pp. 149-152; abs. in *Chem. Ztg.*, 32 (1908), No. 21, *Repert.*, p. 135), is due to an enzym which acts upon a glucosid present in the leaf. His experimental work on the subject is not yet completed.

As regards coffee, Gorter (*Bul. Dept. Agr. Indes Néerland.*, 1907, No. 14, pp. 62; *Liebig's Ann. Chem.*, 358 (1908), No. 3, pp. 327-348; 359 (1908), Nos. 1-2, pp. 217-244) concludes that the caffetannic acid of earlier investigators is not a distinct compound but a mixture of chlorogenic acid, coffalic acid, and other substances, the chlorogenic acid being the dibasic chlorogenic acid existing in the form of caffein potassium salt. Other constituents of coffee are included in Gorter's extended chemical study of the subject.

Hartwich and Du Pasquier (*Apoth. Ztg.*, 24 (1909), No. 14, pp. 130, 131) have reported analyses and discussed them with reference to judging the quality of tea, while Grimshaw (*Brit. Food Jour.* 11 (1909), No. 121, p. 3) has contributed data on the effects of coffee and the use of chicory. In his opinion chicory may exercise a harmful influence and should not be regarded as inert, as is commonly supposed.

ASH CONSTITUENTS OF FOOD AND FOOD DISEASES.

Hart and his associates at the Wisconsin Station have continued (*Amer. Jour. Physiol.*, 23 (1909), No. 4, pp. 246-277), the important work on the role of inorganic phosphorus in the nutrition of animals, which was begun at the New York Experiment Station at Geneva by Jordan and Hart and which has to do quite largely with phytin, a phosphorus constituent of wheat bran. The object of the experiments in the present report was to determine whether inorganic phosphates could take the place of organic phosphates in a ration for growing animals, pigs being used as subjects.

"The marked reduction on the quantity of ash of the bones of the animal receiving an insufficient supply of calcium phosphates, together with the ability of the animal to build up a skeleton very

rich in calcium phosphate when an abundance of the latter is supplied in inorganic forms, strongly points to the possession of a synthetic power by the animal which enables it to convert inorganic forms of phosphorus into the organic forms demanded by its body."

Similar problems have been studied by a number of foreign investigators.

Hart and his associates (*Amer. Jour. Physiol.*, 24 (1909), No. 1, pp. 86-103) also reported on the role of the ash constituents of wheat bran in the metabolism of herbivora, and Hart and Tottingham (*Jour. Biol. Chem.*, 6 (1909), No. 5, pp. 431-444) on the nature of the acid soluble phosphorus compounds of some important feeding materials.

An interesting publication which has to do with the ash constituents and their importance in the diet is *The Mineral Elements in Animal Nutrition*, (Ohio Sta. Bul. 201, pp. 127-172), by Forbes of the Ohio Experiment Station, which summarizes data of value from the standpoint of human nutrition as well as animal feeding. A second paper on this topic by Forbes bears the title *The Balance Between Inorganic Acids and Bases in Animal Nutrition* (Ohio Sta. Bul. 207).

The metabolism of organic and inorganic phosphorus has also been studied by Cook of the Bureau of Chemistry (U. S. Dept. Agr. Bur. Chem. 123, pp. 63, pls. 3).

The work of Goodall and Joslin (*Trans. Assoc. Amer. Physicians*, 23 (1908), pp. 92-106) on ash-free diet is of interest in this connection.

Interesting and suggestive papers which have to do with the mineral metabolism of the body have been published by Diesing and Aufrecht, (*Zentbl. Gesam. Physiol. u. Path. Stoffwechsels*, n. ser., 4 (1909), No. 6, pp. 209-216); *Zentbl. Gesam. Physiol. u. Path. Stoffwechsels*, n. ser., 4 (1909), No. 10, pp. 369-371), which deal with the function of certain glands particularly with reference to the metabolism of iodine, arsenic, iron, and sulphur. According to the summary, iodine metabolism is regulated by the thyroid, arsenic by the thymus, iron by the spleen, sulphur by the suprarenal capsules, calcium by the reproductive organs, and potassium by the pancreas. In general, the specific glandular constituents which regulate mineral metabolism are pigments. If further investigation should confirm this work, it would mark

an important step forward not only in the question of mineral metabolism but in the subject of metabolism in general.

The use of various food products as original or contributing causes of various diseases is a subject on which important contributions have recently been made. As an instance may be cited the work of Lavinder of the U. S. Public Health and Marine Hospital Service (Pub. Health and Marine Hosp. Serv. U. S., 1908, pp. 22), and a number of Italian students on Indian corn and its relation to pellagra. Pellagra, it will be recalled, is a disease most commonly attributed to the use as food of spoiled Indian corn, the dangerous micro-organism present being very resistant to heat and so not necessarily destroyed by the usual methods of household cookery. The character of the zein, the principal constituent of maize, and the deficiency of corn in ash constituents have also been suggested as causes of pellagra and studied with reference to the use of this material in very large quantities as a feeding stuff and for human food. Mention may be made in this connection of Bezzola's paper (Clin. Med. Ital., 46 (1907), No. 3, pp. 161-164; abs. in Biochem. Centbl., 7 (1908), Nos. 18-19, p. 699) on the effect of maize diet.

The question of rice and beriberi has been discussed by W. Fletcher (Jour. Trop. Med. and Hyg. [London], 12 (1909), No. 9, pp. 127-134, pl. 1) and others and the consensus of opinion seems to be that uncured rice, that is, rice which is stored without previous cooking, is a cause of this disease, and that presumably the disease is of bacterial origin though a number of investigators have believed that possibly the deficiency of ash and protein constituents in rice may have something to do with the problem.

Mention may also be made of Rosenheim and Kajiura's (Jour. Physiol., 36 (1908), No. 6, pp. LIV, LV) extended study of the proteids of rice and the possible relation of this constituent to beriberi. In accordance with the results of earlier investigators, no gluten was found in the rice grain, which obviously explains the unsuitability of rice alone for bread making purposes.

A paper of unusual interest from the fact that it furnishes scientific evidence for the old household belief that eating buckwheat in quantity may cause rash and other skin troubles, has been published by Ohmke (Zentbl. Physiol., 22 (1908), No. 22, pp. 685-686) who found that white animals, that is, animals whose skin is not protected from light by a dark colored coat, when fed

buckwheat and exposed to light, developed a disease of the skin, and who isolated from the buckwheat grain a fluorescent body which apparently is connected with fagopyrismus, the buckwheat disease.

WHEAT, FLOUR, BREAD.

Chamberlain's work at the Bureau of Chemistry (U. S. Dept. Agr., Bur. Chem. Bul. 120, pp. 64), on the feeding value of cereals, though primarily undertaken from the standpoint of animal nutrition, supplies a large amount of data regarding the composition of cereal grains.

Milling and baking tests have been reported by a number of investigators in the United States and Canada. Waldron of the North Dakota Station has reported (North Dakota Sta., Rpt. Dickinson Substa. 1908, pp. 24-26, pl. 1) milling and baking tests with a number of varieties including Russian wheats. Stewart and Greaves (Utah Sta. Bul. 103, pp. 243-276, figs. 2) have studied the milling of a large number of samples of Utah wheats grown under different conditions, including both the common bread varieties and durum wheats.

Questions of the milling qualities of wheat have been studied by Thatcher of the Washington Experiment Station, (Washington Sta. Popular Bul. 6, pp. 4), by Brunnich of the Queensland Dept. of Agriculture, (Ann. Rept. Dept. Agr. and Stock [Queensland], 1906-7, pp. 62-68), and by Saunders (Canada Expt. Farms Rpts. 1907, pp. 219-223). Work with Manitoba wheats has been reported by Saunders and Shutt of the Canadian Experimental Farms (Canada Cent. Expt. Farm Bul. 60, pp. 7-21), and wheat and flour testing has also been studied by Harcourt of the Ontario Agricultural College (Ann. Rpt. Ontario Agr. Col. and Expt. Farm, 34 (1908), pp. 79-87). Ladd (North Dakota Sta. Bul. 82, pp. 717-793), reported milling and baking tests with durum and other North Dakota wheats.

The storages of wheat and flour have been studied by several investigators. Leavitt and LeClerc of the Bureau of Chemistry have published a paper (Jour. Indus. and Engin. Chem. 1 (1909), No. 5, pp. 209-302) on changes in the composition of unground cereals during storage. Bell (Oper. Miller, 13 (1908), No. 12, pp. 591, 592, figs. 4; Bakers' Helper, 22 (1908), No. 260, pp. 1132-1134, figs. 4; Amer. Miller, 37 (1909), No. 4, pp. 280, 281, fig. 1),

has reported interesting data on the changes which take place in stored flour.

Few subjects connected with the chemistry of a staple article of diet has been studied more extensively during the period covered by this review than the character of wheat gluten, the estimation of gluten and gliadin, the relation of these constituents of wheat to bread making, the proportion of water which flour will absorb and related matters. Of American work which has been reported may be mentioned Shaw's tests of a polariscopic method for determining gliadin (*Jour. Amer. Chem. Soc.*, 29 (1907), No. 12, pp. 1747-1750); and Mathewson's studies of the estimation of gliadin (*Jour. Amer. Chem. Soc.*, 30 (1908), No. 1, pp. 74-81). Osborne's work on gluten is cited in another section (p 48).

Turning to foreign work, that reported by Hoffmann and Ploetz on the estimation of the water which flour will absorb should be noted (*Ztschr. Spiritusindus.*, 31 (1908), No. 5, pp. 42-43). Gluten from the standpoint of physical chemistry has been studied by Wood and Hardy (*Proc. Roy. Soc. [London]*, Ser. B, 81 (1909), No. B 545, pp. 38-43, figs. 2; abs. in *Jour. Chem. Soc. [London]*, 96 (1909), No. 559, I, p. 341). Liebig's studies (*Landw. Jahrb.*, 38 (1909), No. 2, pp. 251-271) of the sugar content of fine white flour dough before and after fermentation and the diastasic value of white flour are an interesting contribution to the subject of bread making problems. Vandeveld and his associates have also reported (separate from *Verslag. en Meded. K. Vlaam. Akad. Taal en Letterk.*, 1908, pp. 493-526), experiments on bread fermentation.

Of interest in relation to bread making investigations is the paper by Crocker (*Rpt. Ann. Meeting Biscuit and Cracker Manfrs. Assoc.*, 1908, pp. 16-18) on checking or cracking in biscuits and crackers and its prevention.

In connection with bread and bread making, Roussel (*Rev. M. Serv. Intend. Mil. [Paris]*, 20 (1907), No. 152, pp. 122-131; abs. in *Rev. Hyg. et Pol. Sanit.*, 29 (1907), No. 8, pp. 722, 723) has made tests of the possibility of the survival of pathogenic bacteria in bread after baking. According to his observations, the temperature in the crumb of bread during baking ranged from 101 to 103°C. and in the crust from 125 to 140°. The author also studied the effect of such temperatures on tuberculosis bacilli artificially

introduced into the dough with special reference to the question of the employment of tubercular subjects in bakeries, his results being against such a practice.

The report of the Wisconsin Bakers' Institute (Bien. Rpt. Bur. Labor and Indus. Stat. [Wis.] 3 (1906-7), pt. 5, pp. 683-840, figs. 49), discussing baking problems should be noted as it shows an intelligent desire on the part of bakers to cooperate in the effort which is being made under Wisconsin law to insure clean bakeries. The report cited contains a number of papers of general interest, among which may be mentioned The Inner Structure of the Grain as Related to Flour and Bread, by N. A. Cobb; Fermentation in Bread Making, by W. D. Frost, in which the question of malt extracts in conjunction with yeasts to improve fermentation, and similar problems are discussed; Bake Shop Hygiene and Sanitation, by M. P. Ravenel; and a similar paper by C. B. Ball.

PROTEIN CLEAVAGE PRODUCTS.

One of the most important series of investigations along chemical lines dealing with nutrition reported in the United States, is that which has to do with the hydrolysis of proteids of different sorts carried on at the Connecticut State Experiment Station at New Haven by Osborne and his associates, an investigation which has extended over a number of years. In the period covered by this review Osborne and associates have studied the hydrolysis of vicilin (Jour. Biol. Chem., 5 (1908), Nos. 2-3, pp. 187-195) and of legumelin of peas (Jour. Biol. Chem., 5 (1908), Nos. 2-3, pp. 197-205); the vignin of the cowpea (*Vigna sinensis*) (Amer. Jour. Physiol., 22 (1908), No. 3, pp. 362-372); the hydrolysis of vitellin from the hen's egg (Ibid. 24, (1909), No. 1, pp. 153-160); the hydrolysis of the muscle of scallop (Ibid. pp. 161-169); the hydrolysis of crystallized albumen from hen's egg (Ibid. No. 2, pp. 252-262); and the hydrolysis of fish muscle (Ibid. pp. 81-89).

In a paper on the different forms of nitrogen in proteins Osborne and his associates (Amer. Jour. Physiol., 23 (1908), No. 3, pp. 180-200) have summarized some of their important deductions on determinations of the actual quantities of histidin, arginin, and lysin obtained in the cleavage products of protein which show that they vary markedly, particularly as to the yield of arginin and lysin and that proteids, "when arranged in the order of their yield of arginin, fall into three groups. First the oil seeds, then

the leguminous seeds, and finally the cereal grains—the only exception being, the glutelin of maize, which is one of the least well characterized and studied of all the proteins in the list, and may be a mixture of several different proteins.

“We have in the chemical constitution of these seeds proteins [Professor Osborne states] an apparent relationship not only to the biological relations of the plants which produce them, but also to the chemical constitution of the seeds themselves.”

FERMENTS AND FOOD PRODUCTS.

From time to time popular writers have had much to say regarding certain vital principles which they believed existed in raw foods which were of great importance and which could be transferred to the body by some mysterious process not explained. Those who have studied the question from a scientific standpoint do not share this opinion but have long recognized that almost all food products contain specific enzymes which would be destroyed if cooking were long enough continued and some have believed that these enzymes might exercise a favorable effect in the digestive tract if their activity were not thus destroyed. Others urge that as the digestive tract is abundantly supplied with enzymes there is no more reason for making a special effort to add them to the food than there is for supplying a normal man with a crutch. It is worthy of note that medical men seem to attach less importance to the medicinal use of ferments than formerly. Whatever the final decision in the case may be, information is accumulating on this topic of the amount of enzymes present and their character. As illustrations may be mentioned, Aron's and Klempin's work (*Biochem. Ztschr.*, 9 (1908), Nos. 1-2, pp. 163-184) on the proteolytic enzymes of oats, barley and vetch.

COLD STORAGE AND CHANGES IN FOOD.

A report on the effects of cold storage on eggs, quail and chicken was made by Doctor Wiley and his associates (U. S. Dept. Agr., Bur. Chem. Bul. 115, pp. 117, pls. 13), showing the losses in weight and changes in chemical character, etc. The general conclusion reached is that in the case of frozen birds, “there is no indication of any improvement in quality, that is, in taste, odor or flavor, during cold storage. There is a deterioration which is noticeable, even at the end of three months, and becomes more

marked as the time of storage grows longer. Hence, without any reference whatever to the question of wholesomeness, cold storage prolonged for six months or more appears to be distinctly detrimental as far as taste, flavor and palatability are concerned.

"The intestines which are left in situ in storage birds, show a very marked degeneration. Their muscular walls grow thinner in cold storage until they are the merest remnants, which threaten to disappear altogether and which even very careful handling may easily rupture. This degeneration is noticeably active in the muscular rather than in the cellular tissues of the intestines. This is important when it is considered that the bacterial flora of the intestinal contents will, of course, contain any pathogenic germs which usually accompany the colon bacillus. Hence the perforation of the walls of the intestines, which apparently takes place by continued digestive processes even in cold storage, would open the way for a rapid migration of such bacteria on thawing and previous to cooking. Thus it is quite possible that dangerous bacterial organisms might be translated to the edible portions of the fowl through the perforations of the intestines in the period between thawing and cooking. This degeneration of the walls of the intestines must, therefore, be regarded as highly significant."

Of studies of the changes which take place during cold storage, mention should be especially made of the work of Miss Pennington of the Bureau of Chemistry of which a portion has been summarized in an article on the changes taking place in chickens in cold storage in the Yearbook for 1907 (U. S. Dept. Agr. Yearbook, 1907, pp. 197-206, pls. 7). In the light of her investigations she writes: "The dictum of the warehousemen that there is no change in cold storage poultry and that it may be kept for an indefinite period can not be accepted in its entirety. Both microscopic study and the taste of the cooked fowl confirm the fact that macroscopically visible degeneration does take place."

The question of drawn and undrawn poultry kept in cold storage was also studied by Boos in connection with the Massachusetts State Board of Health (Ann. Rpt. Bd. Health Mass., 39 (1907), pp. 263-283). From his experimental studies Boos concludes that "it is best to draw fowl in a different manner from that usually followed, before they are placed in cold storage. After removal from cold storage, the fowl should never be contaminated

by soaking in water, but should thaw in the air. Ordinary drawing is worse by far than no drawing at all."

According to Brown's investigations (Ann. Rpt. Bd. Health Mass., 39 (1907), pp. 285-336), "decomposition depends largely upon the presence of moisture in the tissues, for moisture is absolutely essential to bacterial growth. In freshly killed birds, ordinarily or properly drawn, the surfaces quickly become dry. In cold storage birds, no matter how they are drawn, the tissues will be moist, because of the melting of the crystals of ice. If properly drawn, there would be but few bacteria present capable of causing decomposition."

Similar investigations were carried on by Bissell (Buffalo [Dept. Health], 1909, pp. 4; Ann. Rpt. Dept. Health Buffalo, 1908, pp. 34-39; abs. in Buffalo [Dept. Health] Sanit. Bul., n.s., 2 (1909), No. 3, pp. 1, 2) under the auspices of the Buffalo Department of Health, and the effects of cold storage studied with drawn and undrawn turkeys. He concludes that when stored for a year no change had taken place which made the food detrimental to health, provided it was in proper condition when placed in storage. He also notes that when turkeys are stored undrawn there is a tendency for the odor, and undoubtedly the taste, of the material contained in the intestines to permeate the adjacent tissues at the time of the thawing out process. There is also the possibility of the bacteria contained in the intestinal contents migrating through the abdominal tissues at the same time. He believes, therefore, that the poultry should be properly killed and drawn before storage.

The studies of the effects of storage on composition and quality of raw and cooked beef and chicken by Grindley and associates have been referred to earlier (see p 40). Fresh and frozen drawn and undrawn fowl differed little in composition and nutritive value, when considered on the basis of a uniform fat and water content. As regards the juiciness and flavor of the cooked beef, the data are considered in favor of the cold storage product.

Burke (Amer. Food Jour., 3 (1908), No. 9, pp. 7-10) discusses the legislative enactments which have to do with this question and recommends more extended legislation. In his opinions the arguments are all in favor of drawing poultry.

Rideal (Cold Storage and Ice Trade Jour., 36 (1908), No. 4, pp. 32, 33) discusses the general problem of the dietetic value of

refrigerated foods. According to his experiments on fermentation processes with reference to cold storage, "the action of diastase is not entirely prevented by cold but is rendered very slow. The tenderness and maturing of refrigerated meat, is attributable not only to the action of sarcolactic acid but also to the gradual and limited work of natural enzymes (pepsin and trypsin), [present in the flesh], which cause a certain amount of predigestion."

Richardson and Scherubel's studies of frozen beef (*Jour. Amer. Chem. Soc.*, 30 (1908), No. 10, pp. 1515-1564) did not indicate decomposition during cold storage and in their judgment beef thus stored for 610 days did not differ in flavor from fresh beef. Their general conclusion is that cold storage below 90°C. is an adequate and satisfactory method for the preservation of beef for at least 554 days. The authors further conclude that freezing meats at 9° to 12° arrests bacterial decomposition, though freezing of course can not restore tainted meat to its original condition. (*Jour. Indus. and Engin. Chem.* (1909), No. 2, pp. 95-102).

COOKING AND COOKING PROBLEMS.

The numerous studies of the relative merits of different varieties of wheat and flour ground from them involve baking tests which as a whole have contributed not a little to the subject of bread and bread making. This side of the work might profitably be included under the heading of cooking problems but for various reasons has been referred to elsewhere. Aside from this work, a number of studies of cooking problems have been reported.

The experiments by Grindley and his associates on the cooking of fresh and cold storage beef and fresh and cold storage chicken, drawn and undrawn, have also been referred to in another section (p 40). In the work, which is extended and valuable, changes and losses due to cooking are considered, and also the composition and quality of the cooked and raw product.

A paper of interest in connection with the changes which take place in the cooking of meat is published by Meigs (*Amer. Jour. Physiol.*, 24 (1909), No. 1, pp. 178-186, dgms. 6) under the title Concerning the Supposed Connection Between Protein Coagulation and the Heat Shortening of Animal Tissues.

Of interesting cooking tests may be mentioned Miss Watson's report of studies with different kinds of flour to determine whether

strong wheat or soft wheat is best for milk biscuits made with baking powder (Ann. Rpt. Ontario Agr. Col. and Expt. Farm, 34 (1908), pp. 242-247).

In a report of the examination of baking powders on sale in Canada, McGill (Lab. Inland Rev. Dept. Canada Bul. 174, pp. 27) discusses the keeping quality of baking powder, the efficiency of different types as gas producers, and other questions, and reports determinations of the available, total, and residual gas, and of the excess of bicarbonate of soda in the different brands of powders.

Miss Day (Jour. Home Econ., 1 (1909), No. 2, p. 177) of the University of Missouri has contributed some notes on the effects of cooking on cellulose. Of particular importance is Miss Day's paper published by the Office of Experiment Stations (U. S. Dept. Agr. Office Expt. Stas. Bul. 202), entitled *Digestibility of Starch of Different Sorts as Affected by Cooking*.

Artificial digestion experiments, using different sorts of ferments, were made with potato, wheat, corn, and other starches, with the object of determining the effect of heat on the digestibility of starch, under common household conditions. The conclusion was reached that potato, arrowroot, and probably tapioca and sago starches, are not made more easily digestible by long continued cooking, while the reverse is true with cereal starches though the change occurs very slowly. Experimental data are discussed with reference to household cooking problems.

Miss Mitchell's course in cereal foods and their preparation, also published by the Office of Experiment Stations (U. S. Dept. Agr., Office Expt. Stas. Bul. 200), contains a syllabus of a course of lectures on the preparation and nutritive value of cereal foods, each lecture being accompanied by suggestions for practical work and experiments.

Many cooking tests with records of cost and quantities have been made by Miss Caroline Hunt in connection with studies of the economical use of meat, which have been carried on as a part of the nutrition work of the Office of Experiment Stations. The results are being prepared for publication in a summary of data on this subject.

FIRELESS COOKER AND OTHER HOME CONVENIENCES.

The question of fireless cookers has been much discussed. Special interest attaches to the investigations carried on under

the auspices of the Commissary-General of the United States Army with reference to the use of such devices for preparing food for soldiers engaged in field duty. In general, the results have been favorable. (Rpt. Commis. Gen. [U. S. Army], 1908, pp. 10-13).

Miss Ellen A. Huntington (Bul. Univ. Wis., No. 217, pp. 38, figs. 10) has reported from the Univ. of Wis. a number of experimental studies with the fireless cooker both with respect to the materials used in its construction and its efficiency as a cooking device.

At least two books have been published devoted to the use of the fireless cooker, both of which are based on the experience of the writers, namely, *The Fireless Cooker*, by Caroline B. Lovewell, Francis D. Whittemore, and Hannah W. Lyon (Topeka, 1908, pp. 211, figs. 11), and Margaret J. Mitchell's *The Fireless Cookbook* (New York 1909, pp. XII + 315, figs. 18).

The question of labor saving devices has been discussed by Le Bosquet (Bul. Amer. School Home Econ., Ser. 1, 1908, No. 11, pp. 48, figs. 54) who summarizes a great deal of valuable data regarding kitchen appliances, laundry appliances, alcohol and electricity for cooking, and other topics. This bulletin deserves special mention as it is an excellent summary based on careful tests and other data.

Barnard (Housekeeping Expt. Sta. [Conn.] Bul. 4, pp. 4), at his experimental housekeeping station has studied the use of alcohol as a fuel for household purposes.

Reference should also be made to *The Household Gas-Cookery Book* (London, 1908; rev. in *Epicure*, 15 (1908), No. 180, p. 310). by Miss Edden and Mrs. Moser. Though an English publication and concerned chiefly with conditions in Great Britain, it is of interest to American students.

CANNING, PRESERVING AND DRYING FOODS.

Each year a substantial contribution is made to the question of preserving food by domestic methods. The following articles are of interest in this connection:

At the Oregon Experiment Station, Pernot (Oregon Sta. Bul. 98, pp. 3-6) studied home canning of mushrooms. According to his results they may be readily canned in their own liquor in either tin or glass by usual household methods, the young mushrooms being best for the purpose. Sterilizing the cans at intervals for

several days is recommended, which is in accord with the general observation that fractional sterilization is of great importance in canning.

The canning of peas has been studied by Bitting (U. S. Dept. Agr., Bur. Chem. Bul. 125, pp. 32, figs. 6), while Breazeale has published a Farmer's Bulletin (U. S. Dept. Agr., Farmers' Bul. 359, pp. 16, figs. 9) on canning vegetables in the home which contains a large amount of useful information, based on his experiments.

Kochs and Weinhausen (Ber. K. Gärt. Lehranst. Dahlem 1906-7, pp. 146-161; Pure Products, 4 (1908), Nos. 11, pp. 517-522; 12, pp. 565-571) studied the temperature attained in sterilizing preserved fruits and vegetables and noted that as others have found, in sterilizing canned goods the diffusion of heat is dependent upon the manner in which the canned contents are packed. The more solidly the material is packed, and the less fluid in the can, the greater the difficulty with which heat will penetrate. Fractional sterilization is recommended.

The question of canning meats, particularly with reference to the disposal of defective cans, was studied by McBryde (U. S. Dept. Agr., Bur. Anim. Indus. Rpt. 1907, pp. 279-296, fig. 1).

Tonney and Gooken (Amer. Food Jour., 3 (1908), No. 6, pp. 20-23, figs. 3) studied the composition and character of the gases contained in swollen i. e. spoiled canned goods.

Of decided interest in connection with the use of home canned foods as compared with commercial products canned in tin is the report of the Local Government Board of Great Britain by Schryver (Local Govt. Bd. [Gt. Brit.], Med. Dept., Rpts. Insp. Foods, 1908, No. 7, pp. 30), on the presence of tin in certain canned foods. Old tinned foods, particularly those containing much acid, may contain considerable proportions of tin, particularly if any solder is present on the inside of the can, but the data presented, according to the author, "do not indicate much probability of serious risk of chronic poisoning by the absorption of nonirritant compounds of tin as a result of a diet which consists largely of canned foods and is continued over considerable periods of time."

In this connection mention may be made of Kossowicz's bacteriological studies of the softening of pickled cucumbers, (Ztschr. Landw. Versuchsw. Österr., 11 (1908), No. 12, pp. 894-

900), the conclusion being reached that the potato bacterium (*B. mesentericus vulgatus*) is certainly concerned in the softening.

Jelly making has been studied by at least three American investigators, namely, Belling, of the Florida Experiment Station (Florida Sta. Rpt. 1908, pp. CV-CIX), who worked with guava jelly under a variety of conditions, Miss Nellie E. Goldthwaite of the University of Illinois (Jour. Indus. and Engin. Chem., 1 (1909,) No. 6, pp. 333-340) who studied the chemistry and physics of jelly making, and Miss Jenny H. Snow, (Jour. Home Econ., 1 (1909), No. 3, pp. 261-266) who studied particularly the effects of sugar and temperature on the cooking of fruit juices in jelly making and other ways.

Miss Snow's paper was published in the JOURNAL OF HOME ECONOMICS and is familiar to its readers. An interesting feature of Miss Goldthwaite's work is the experimental contribution to the subject of acid in jelly making. She has clearly shown the importance of this constituent in jelly making and has furnished experimental proof of the housekeeper's belief that adding acid (lemon juice) would make good jelly from such materials as strawberry juice which do not otherwise gelatinize.

Dehydration or evaporation has long been followed as a method of preserving fruits, meat and vegetables, and in recent years the process has been greatly improved and applied to other materials. Dent of the Navy Department reports (Navy Dept., Bur. Supplies and Accts., Mem. Inform. Off. Pay Corps, [etc.], No. 85, pp. 626, 627) the results of a test of such goods in the United States Navy. He found that dehydrated eggs and a majority of the dehydrated fruits and vegetables studied gave good results, but the powered milk was not so satisfactory. Some information is also given by Dent regarding the quantity of dehydrated material required in comparison with fresh goods.

Booth (Spice Mill, 31 (1908), No. 10, pp. 620-623) in a paper on desiccated milk describes the process of manufacture of such goods and gives analyses for a number of commercial products containing varying amounts of fat, corresponding to the use of skimmed or partially skimmed milk for evaporating.

THE HYGIENE OF FOODS.

It is sometimes claimed that flesh foods contain great numbers of bacteria and the statement has been made that they are often

found in cooked flesh foods. It is therefore interesting to note Bruns' careful study of this problem with special reference to cooked fish (*Über das bakteriologische Verhalten des Fischfleisches nach der Zubereitung*. Inaug. Diss., Univ. Munich, 1908, pp. 29; Arch. Hyg., 67 (1908), No. 3, pp. 209-236). He found that the interior of the flesh and the surface of freshly cooked fish were free from bacteria and would remain so provided the fish were carefully stored and handled, as for instance by wrapping in sterile paper and keeping at suitable temperature.

In connection with his work he summarizes a large amount of data gathered by other investigators which show conclusively that the consensus of opinion of those who have studied the problem under properly controlled conditions is that the flesh of healthy animals is sterile. There are certain animal diseases which result in bacteria in the tissues but the flesh of such animals is not intentionally used as food in this country and under any circumstances can be thoroughly sterilized by cookery, as is demonstrated by the Belgian municipal sterilizing plants which are operated with meat of such animals to supply cheap meat food to poor people.

It seems very evident that those who have reported bacteria in or on flesh foods have not taken proper precautions to prevent contamination from the air. It is certainly true that the so-called air bacteria, which may include a variety of species, are found on bread, meat, fruit, and all food products exposed to the air, apparently in the nature of things in a greater quantity on moist foods than on those which have a drier surface.

Those who are interested in meat inspection and the general consideration of what may be called diseased meat from the standpoint of hygiene and dietetics should read the paper by Professor T. Smith on the subject, which recently appeared (*Amer. Jour. Pub. Hyg.*, 19 (1909), No. 2, pp. 397-411).

Data have accumulated regarding the possibilities of acquiring pathogenic and other bacteria by means of raw foods, including fruits, vegetables, and other materials contaminated with dust or in other ways. Among papers of this subject may be mentioned Ressel's work (*Über fäkale Verunreinigungen auf Obst und Gemüse*. Inaug. Diss., Univ. Berlin, 1907, pp. 27; abs. in Hyg. Zentbl., 4 (1908), No. 1, p. 16).

Students of nutrition will be interested in Fillinger's study (*Ztschr. Untersuch. Nahr. u. Genussmtl.*, 16 (1908), No. 4, pp. 232-234) of the hygiene of cooking utensils, particularly aluminum in contact with milk, wine and some salt solutions. Fresh milk did not dissolve an appreciable quantity of it and milk and the serum of very sour milk only traces. Wine cooked in aluminum dissolved none of the metal.

The proper method of marketing oysters has received a good deal of attention in connection with pure food work in the United States. The studies of the water content of oysters packed and marketed in various ways reported by Willard of the Kansas Experiment Station (*Bul. Kans. Bd. Health*, 4 (1908), No. 1, pp. 4-12) is an important contribution to this subject.

As regards the relation of hygiene to food, Nash's studies (*Lancet* [London], 1908, II, No. 23, pp. 1668, 1669) showing the intimate connection between flies, milk, and epidemic diarrhea deserve special mention.

A great deal of interest has been aroused by the publication of Metchnikoff's work on special lactic acid-forming ferments as an intestinal disinfectant. In this connection Herter's paper on *The Therapeutic Action of Fermented Milk* (*Pop. Sci. Mo.*, 74 (1909), No. 1, pp. 31-42) may be mentioned as well as Metchnikoff's popular summary of data on the subject which appeared in a recent number of the *Century Magazine* (November, 1909). The question is being studied by many investigators and it is worthy of note that the results obtained are not uniformly in accord with Metchnikoff's contention and this subject furnishes another good illustration of the need for caution in drawing general and sweeping conclusions from a limited amount of data. From the interest which the subject has aroused, it seems probable that before many years have passed so much experimental evidence will be available that the whole subject will be thoroughly understood.

Of recent American studies which have to do with intestinal putrefaction and related questions may be mentioned *The Fecal Bacteria of Healthy Men*, by MacNeal, Latzer and Kerr, which formed a part of extensive studies of meat carried on at the University of Illinois (*Jour. Infect. Diseases*, 6 (1909), No. 2, pp. 123-169, fig. 1) and *Some Observations on the Study of the Intestinal Bacteria*, by Kendall (*Jour. Biol. Chem.*, 6 (1909), No. 6, pp. 499-507).

The general subject of handling and caring for food in the home with reference to hygiene has been discussed in a Farmers' Bulletin by Mrs. Mary Hinman Abel (U. S. Dept. Agr., Farmers' Bul. 375).

DIET AND DIETARY STUDIES.

The Office of Experiment Stations has made two contributions to this subject, namely, dietary studies in rural regions in Vermont, Tennessee, and Georgia by J. L. Hills, Charles E. Wait, and H. C. White (U. S. Dept. Agr., Office Expt. Stas. Bul. 221) and dietary studies of public institutions in Philadelphia and Baltimore (U. S. Dept. Agr., Office Expt. Stas. Bul. 223) which report investigations carried on by a number of those directly associated with the Department of Agriculture work. The bulletin on dietary studies in rural regions reports four studies in Vermont, seventy in the mountains of Tennessee, and fourteen in Georgia, together with a few others made for purposes of comparison. As a whole, the bulletin supplies a large amount of statistical and other data regarding living conditions in rural regions, particularly those remote from large centers of population where conditions are very different from those which prevail in towns, cities and farms which are otherwise situated.

The studies in public institutions were made in homes for the aged and orphan asylums, including institutions under municipal and under private management, and were undertaken with a view to securing additional data regarding food requirements for the aged and for young children and also as a demonstration of the desirability of using nutrition methods in the study of institution problems from the standpoint of institution interests.

A publication of the Office of Experiment Stations may also be mentioned which gives a general summary of data with recommendations for dietary standards in terms of food purchased, food eaten, and food digested, and including estimates of the amounts of the principal mineral constituents of the diet required per man per day. This is entitled *Food and Diet in the United States*, and appeared in the Yearbook of the Department of Agriculture for 1907 (U. S. Dept. Agr. Yearbook 1907, pp. 361-378) and also as a reprint.

The Report of the Committee on Social Betterment, appointed by President Roosevelt, (Report of the President's Homes Commission, Sen. Doc. 644, 60th Cong. 2d Session, pp. 121-157)

contains several papers on food for wage earners' families and related topics, the same material being included in the full report of the President's Homes Commission by Kober and others (Reports of the President's Homes Commission. Washington, D.C., 1908 [pt. 5], pp. 281, pls. 4; Reprint, pp. 281, pls. 4).

Of dietary work may be mentioned the information summarized regarding food habits, etc., of Mexican laborers in the United States by Clark of the Department of Commerce and Labor (Bur. Labor [United States] Bul. 78, pp. 466-522).

Miss Agnes Hunt of the University of Illinois reports data regarding the nutritive value and cost of food served in a students' boarding club (Ill. Agr., 12 (1908), No. 5, pp. 146-148).

Army diet has been discussed by Blackham (Brit. Med. Jour., 1908, No. 2484, pp. 310-317) and extensively studied under Government auspices with reference to the British soldier. It may be noted that this report after careful consideration of the topic retains the Atwater dietary standards.

In a study of dietetics in reference to tuberculosis Bardswell and Chapman (Proc. Roy. Soc. [London], Ser. B. 80 (1908), No. B, 538, pp. 151-160) report data on the diet of 100 working-class families in Great Britain, which they regard as physiologically adequate. They find that the food supplied 119 gm. protein and 3,700 calories of energy in round numbers per person per day, at a cost of 20 cts.

The food of peasants in Finland has been studied by Sundström (Untersuchungen über die Ernährung der Landbevölkerung in Finland. Helsingfors, 1908, pp. 230; rev. in Rev. Gen. Sci., 20 (1909), No. 5, p. 204; Biochem. Zentbl., 8 (1909), No. 10, p. 505). They are apparently well nourished, the average rations supplying 136 gm. of protein, according to the author, and about 4,000 calories of energy.

One of the interesting and valuable recent books on nutrition is Sutherland's *A System of Diet and Dietetics* (London, 1908, pp. 906; rev. in Brit. Med. Jour., 1909, No. 2513, by Epit., pp. 537-539) which contains articles by different authors on a wide variety of topics concerned with diet in health and disease. Among others are a paper on the Evolution of Diet by H. Campbell, on the Physiology of Digestion by E. I. Spriggs, on Diet in Old Age, by H. Campbell, and on Diet in Hot Climates, by Sir P. Manson.

A dietary study covering one month was made at the Institute for Colored Youth, a school which is conducted under the management of the Society of Friends at Cheyney, Penn. (Daily Menus for the School Year and a Dietary for October. Cheyney, Pa., 1909). The result showed that the food supply was adequate, animal food abundant and the diet reasonable in cost. It is stated that improvement in weight, in capacity for work and in general condition was noticeable in pupils after living on the generous diet which the school provides. The feature of handling the dietary problem at this school is the combination of teaching and practice work with the selection, purchase and preparation of the food for the school as a whole.

Animal feeders have devoted a great deal of attention to the study of the utilization of nonproteid nitrogen and of combinations of proteid cleavage products as a substitute for protein. The work is of interest in connection with the human nutrition problems. Among other papers may be mentioned that of Morgen and his associates (*Landw. Vers. Stat.*, 71 (1909), Nos. 1-3 pp. 1-170). Such work as theirs is of interest as bearing on many questions of nutrition, and among others upon the kind and quantity of protein required.

DIETARIES OF NATIVE RACES.

The food problem of native races in the Orient is a matter upon which erroneous ideas are very commonly prevalent, though perhaps no well informed person would say today, as has so often been said in the past, that these Eastern races live almost exclusively on rice, realizing that the rice, where this is the principal cereal, is supplemented by beans and bean products, by fish, and other sea food, and usually, outside of Japan, by meat, particularly pork, poultry, and eggs in quantity. Indeed so great is the production of pork and poultry and eggs in China that such products are exported to other countries, the trade in eggs being very large. At the present time there is considerable discussion in English food journals as to what constitutes proper inspection of such Chinese food products when imported.

Of studies of food problems in the East may be mentioned Kermorgant's paper (*Ann. Hyg. Pub. et Méd. Lég.*, 4. ser., 7 (1907), pp. 411-431) on diet in Indo-China. He states that the

natives, as is the case with other regions in the Far East, live very largely upon rice, pork, fish, and vegetables, rice being eaten in very large quantities. He maintains further that Europeans living in the Tropics should exercise moderation in diet and avoid an excess of energy-yielding foods though this part of the diet must be proportional to the amount of physical work performed.

Matignon (*Rev. Hyg. et Pol. Sanit.*, 31 (1909), No. 2, pp. 120-125) describes the food habits of the Chinese in North China and gives general data regarding the animal and vegetable foods which they use.

Data regarding Chinese dietetics are also reported by Little (*Diplo. and Cons. Rpts.* [London], Misc. Ser., 1908, No. 671, pp. 24, map 1).

Matignon and Salm (*Rev. Hyg. et Pol. Sanit.*, 30 (1908), No. 6, pp. 471-484) report data on dietary conditions in Java.

Babbitt (*Mo. Cons. and Trade Rpts.* [U. S.], 1909, No. 344, pp. 213-222) an American consul in Japan, has summarized a considerable amount of data on Japanese diet and a still larger amount is available in a recent volume on Japanese agriculture, entitled *Agriculture in Japan*. (Tokyo; Govt., 1908, pp. 455).

Food in Asiatic Turkey is briefly described in one of our Consular Reports (*Daily Cons. and Trade Rpts.* [U. S.], 1908, No. 3297, pp. 8-10).

Diet in the Philippines has been discussed in one of the earlier numbers of the *JOURNAL OF HOME ECONOMICS* (1 (1909), No. 2, pp. 171-173) on the basis of data supplied by an officer of the U. S. Army and is discussed on the basis of much more extensive data gathered on the ground in a paper entitled *Diet and Nutrition of the Filipino People* by H. Aron (*Philippine Jour. Sci., B. Med. Sci.*, 4 (1909), No. 3, pp. 195-202). The conclusion was reached that per kilogram of body weight or better per square meter of body surface the Filipino obtains from his diet, which is composed largely of fish, beans, rice and fruits, very much the same quantities of protein and energy as the average American or European from his ordinary diet.

A study of strict vegetarianism has been reported from Japan by Yukawa (*Arch. Verdauungskrank.*, 15 (1909), pp. 471-524, 609-646), which was made with Buddhist bonzes [monks]. The food was very simple, consisting largely of rice and barley with vegetables, soy bean products, and rape seed oil. The diet

studied supplied the young monks at rest 57.1 gm. protein and 1,804 calories; a young monk at light work 86.5 gm. protein and 2,731 calories; and the old men at rest 60.4 gm. protein and 2,020 calories of energy. If the low body weight [98 to 115 lbs.] is taken into account, the values are not so low as they would seem at first thought.

THE DIET OF CHILDREN AND SCHOOL LUNCHES.

Many investigations have been reported which have to do with infant feeding but as this is a subject which demands special treatment no attempt will be made to summarize the work at the present time.

Maurel has published (*Rev. Soc. Sci. Hyg. Aliment.*, 3 (1906), No. 5, pp. 763-854) a very interesting summary of data which bears on the subject of children diet and gives what the author considers the maintenance requirements in infancy, youth, middle life, and old age. His estimate for protein is 1.5 gm. with 35 to 38 calories of energy per kilogram of body weight, which would be equivalent to 105 gm. of protein for a man during middle life and weighing 70 kilograms.

The question of school lunches has come very much to the fore in the last few years and the contribution during the last year or two has been large as the mere enumeration of titles would show. Of work of this character may be mentioned an account of cooking and serving a five-cent lunch in the Honolulu Normal School by Marion Bell (*Boston Cooking School Mag.*, 12 (1908), No. 6, pp. 292, 293), and an account of serving hot lunches in 12 schools reported in the Annual Report of the Women's Educational and Industrial Union (*Ann. Rpt. Women's Ed. and Indus. Union*, 29 (1908), pp. 34, 35).

Caroline L. Hunt has published through the U. S. Bureau of Education (*Bur. of Ed. [U. S.] Bul.* 3, 1909, pp. 62, pls. 3, dgm. 1) an important monograph on the subject of diet for school children which summarizes the bulk of the work hitherto published and makes a number of recommendations and deductions.

The problem of the feeding of school children in Liverpool has been studied by Hope (*Pub. Health [London]*, 22 (1908), No. 3, pp. 97, 98), and Crowley (*Pub. Health [London]*, 20 (1908), No. 5, pp. 325-335, chart 1) describes at length the plan followed at

Bradford, England, for furnishing breakfasts and dinners to school children in the poor quarters of the city.

Sill's experimental study of malnutrition in the school child in New York City (*Jour. Amer. Med. Assoc.*, 52 (1909), No. 25, pp. 1981-1985) deserves special mention, as it records the improvement in health and in general condition which followed better hygiene and a more generous diet.

Legendre (*Abs. in Rev. Sci. [Paris]*, 5. ser., 9 (1908), No. 23, p. 723) discusses diet with special reference to French schools. Goldschmidt, one of the American consuls in France, summarizes information (*Daily Cons. and Trade Rpts. [U. S.]*, 1909, No. 3384, p. 13) regarding French school canteens and Arnozan (*Rev. Pédagog.*, n. ser., 53 (1908), No. 10, pp. 301-325), gives a general discussion of student diet in France.

Mention may also be made in this connection of the data regarding the proposed ration for agricultural and technical schools in Chile (*Bol. Min. Indus. i Obras Pub. [Chile]*, 7 (1908), No. 1, p. 8; *An. Agron. [Santiago de Chile]*, 2 (1907), No. 3, p. 283).

The Starr Center in Philadelphia which has been engaged in serving penny lunches and other school lunch work has been described briefly in the reports of the Starr Center Association for 1908 and 1909.

The dietary study and nutrition work at the School for Colored Youth at Cheyney, Pennsylvania, has been referred to in another section (p 61).

DIETARY STANDARDS AND PHYSIOLOGICAL REQUIREMENTS.

The question of dietary standards and what constitutes a reasonable amount of protein and energy for persons of different age and occupation, the matter of optimum allowance as distinguished from minimum or maximum allowance, the physiological effects of overnutrition and undernutrition, the distinction between physiological requirements and dietary standards, and related matters still continue to be most important nutrition topics. Fortunately, information is accumulating rapidly. However, until the subject is thoroughly understood, it can not be too often said that everyone interested in the subject should keep an open mind and weigh fairly and justly the results which investigators are reporting. The question is so large that it is

difficult to see all sides at once. The hesitancy to draw sweeping deductions which is observed among those who are making the largest experimental contributions to the subject, is in marked contrast to the sweeping generalizations which are sometimes made by those who approach the subject from a popular standpoint.

In a volume entitled *The Nutrition of Man*, Professor Chittenden (New York) 1907, pp. XII + 321, figs. 29) has continued his extended and important studies of food requirements, particularly with reference to the amount of protein which is desirable and the effects of the long continued use of small quantities of protein, the results with dogs indicating that these animals can remain in perfect comfort and good condition with a much smaller amount than some other investigators have maintained. In general, he concludes that "the nutrition of man, if it is to be carried out by the individual in a manner adapted to obtaining the best results, involves an intelligent appreciation of the needs of the body under different conditions of life, and a willingness to accept and put in practice the principles that scientific research has brought to light, even though such principles stand opposed to old-time traditions and customs. The master words which promise help in the carrying out of an intelligent plan of living are moderation and simplicity; moderation in the amount of food consumed daily, simplicity in the character of the dietary, in harmony with the old saying that man eats to live and not lives to eat. In so doing there is promise of health, strength and longevity, with increased efficiency, as the reward of obedience to Nature's laws."

In *Reform in our Diet* by Hindhede, translated into German by Bargum (*Eine Reform unserer Ernährung*, Copenhagen and Leipsic, 1908, pp. 232, pl. 1, figs. 4) the author recommends on the basis of experience with himself and family and others a low proteid diet, which in his own case consists of potatoes, bread, grits, fruit, with considerable amounts of fat and small amounts of meat, eggs, etc.

One of the most important papers which has to do with this subject, is McCay's report of nutrition investigations with natives of India which bears the title *Constituents of the Urine and Blood and the Bearing of the Metabolism of Bengalis on the Problems of Nutrition* (*Sci. Mem. Med. and Sanit. Depts. India, n. ser.*, 1908, No. 34, pp. 67). The records and observations extend over

long periods with Bengalis, Anglo Indian, and Eurasian students and compare the native diet which is low in protein and fairly high in non-nitrogenous materials, particularly carbohydrates, with the more generous diet of the other groups. In general, the conclusions are unfavorable to the low diet and on the basis of experimental evidence, it is the author's belief that such a diet followed for generations results in smaller body development, inferior productive power for useful labor, and a greater susceptibility to disease. Susceptibility to diabetes in the Bengalis is especially marked. Doctor McCay's paper has excited a great deal of interest in the United States and elsewhere and it is interesting to note that he is now in close touch with one of the foremost investigators in the United States and is cooperating in studies which will furnish additional light on this subject.

A very interesting contribution to this subject is the report of Albertoni and Rossi (*Arch. Expt. Path. u. Pharmakol.*, 1908, Sup. pp. 29-38) on the effects of adding meat to the vegetarian diet of peasants of the Abruzzi region in Italy. According to their investigations, increased power of assimilation, and an increase in body weight, physical strength and the hemoglobin content of the blood, were noted.

Biernacki (Reprint from *Poln. Arch. Biol. u. Med. Wiss.*, 3 (1907), pp. 272-313; *Zentbl. Gesam. Physiol. u. Path. Stoffwechsels*, n. ser., 2 (1907), No. 11, pp. 401-414); (*Zentbl. Gesam. Physiol. u. Path. Stoffwechsels*, n. ser., 4 (1909), nos. 12, pp. 449-455; 13, pp. 481-496), has reported some investigations which have a bearing upon changing the nutritive value of a ration either by lowering the protein content or increasing the proportion of nonnitrogenous material. In his experiments on the influence of an excess of fat upon the digestive tract and upon metabolism the chief effect noted was a lowering of the oxidation of protein, which was manifested as a decrease in the amount of urea excreted and an increase in the urine constituents called amido acids. An excess of sugar also caused a lowering of the urea coefficient but starch did not have this effect. The experiments reported were made with dogs.

Of great importance are Rubner's papers on nutrition processes during the growth of the child (*Arch. Hyg.*, 66 (1908), Nos. 1-2 pp. 81-126); theory of nutrition after completion of growth (*Ibid.*, pp. 1-80); problems of growth and length of life from the

standpoint of energetics (Ibid. pp. 127-208, charts 2); Sitzber. K. Preuss. Akad. Wiss., 1908, II, pp. 32-47); and the problem of duration of life and its relation to growth and nutrition (Das Problem der Lebensdauer und seine Beziehungen zu Wachstum und Ernährung. Munich, 1908, pp. VIII + 208; rev. in Biochem. Centbl., 7 (1908), Nos. 15-16, pp. 593-594).

Of papers which have to do with questions of undernutrition may be mentioned the article on diet of the poor and its social significance by Rubner (Rev. Hyg. et Pol. Sanit., 29 (1907), Nos. 9-10, pp. 854, 855), who discusses the results which follow the long continued use of a diet of low nutritive value and composed largely or exclusively of vegetable foods such as commonly noted with the poor in Europe. Such a diet as this, he concludes, is responsible for defective physical condition, a lowered ability for work, an increase of morbidity and mortality, a lowered resistance to epidemic diseases, and similar undesirable results.

As regards the food requirements of men engaged in intellectual work; that is, men of sedentary habit, de Fleury (Rev. Soc. Sci. Hyg. Aliment., 3 (1906), No. 5, pp. 855-878) recommends for such persons over 40 years of age 82 gm. protein and 2,200 calories per day.

The physiological protein minimum has been discussed (Ztschr. Physiol. Chem., 59 (1909), Nos. 5-6, pp. 405-491, pl. 1) by Michaud, whose work has attracted a good deal of popular attention owing to the fact that his experiments seem to indicate that the amount is proportional to the character of the protein, the least being required when an animal is fed the flesh of its own species.

In Notes on Scurvy in South Africa, Macrae (Lancet [London], 1908, I, No. 26, pp. 1838-1840) reports data of interest in discussing the importance of protein in the diet. In his opinion scurvy among the Kafirs is attributable to a return to their low diet of corn with a little meat after the generous rations formerly supplied by the Government. He notes the success which has attended the treatment of scurvy by a diet containing an abundance of meat food.

Of articles for and against the use of small amounts of protein in the diet may be mentioned a summary by Haig (Edinb. Med. Jour., n. ser., 22 (1907), No. 6, pp. 501-505; Med. Press and Circ., 138 (1909), No. 3636, pp. 32, 33), the exponent of the uric acid theory.

The possibility of finding satisfactory meat substitutes was studied by E. Salkowski (*Biochem. Ztschr.*, 19 (1909), Nos. 1-2, pp. 83-131). In the experiments reported albumin obtained from meat used in the manufacture of meat extract, albumin from blood and from horse beans, a wheat gluten preparation, and bean meal were studied. The author reaches the conclusion that there seems little likelihood that suitable protein material of vegetable origin can be prepared as a palatable and economical substitute for meat.

Mention may also be made of Crichton-Browne's (*Jour. Roy. Inst. Pub. Health*, 16 (1908), Nos. 8, pp. 471-487; 9, pp. 527-552 discussion of food requirements, which has also appeared in full under the title *Parcimony in Nutrition*. (London and New York 1909).

SOCIOLOGICAL DATA.

Data on sociological topics are included in *Retail Prices of Food, 1890 to 1907*, published by the U. S. Bureau of Labor (Bur. of Labor [U. S.], Bul. 77, pp. 181-332). The cost of living of the working classes in the principal industrial towns of Great Britain is summarized in the same publication pp. (336-353).

Doubtless owing to the increased cost of food and other necessities not only in the United States but in most countries, more attention has been paid during the last two or three years than usual to the cost of living and reports on this subject have been quite numerous. Among other papers may be mentioned a study of the cost of living in New Jersey (*Ann. Rpt. Bur. Statis. Labor and Indus. N. J.*, 30 (1907), pp. 141-157).

The social condition of working-class families in Dublin was studied by Stafford and La Touche (*Brit. Med. Jour.*, 1908, No. 2466, pp. 833, 834) under Government auspices and the data reported are valuable for comparison with conditions in the United States. The bulletin is of interest because of the arguments which the authors make for additional dietary studies and their insistence on the importance of this kind of work to the sociologist and student of nutrition.

A number of sociological studies of working-men's families which include food and nutrition topics and other data have appeared, including Chapin's *The Standard of Living Among Working-men's Families in New York City*, (New York, 1909, pp. 372, dgms. 16); Fox's *Cost of Living of the Working Classes* [in

the United Kingdom], (London, Govt., 1908, pp. LIII + 616, maps 2); his Cost of Living in German Towns, (London: Govt., 1908, pp. LXI + 548, map 1); and his Cost of Living in French Towns, (London: Govt., 1909, pp. LIV + 430).

TECHNICAL SUBJECTS CONNECTED WITH NUTRITION.

On the more technical side of nutrition work much has been accomplished.

The annual reports of the U. S. Secretary of Agriculture and of the Director of the Office of Experiment Stations for 1908 and 1909 have briefly described the construction of the improved respiration calorimeter at the Department of Agriculture and outlined the plans for experiments with it.

This work is well under way and the special object of study is the ease of digestion of cheese of different sorts as compared with other foods. The scope and extent of the nutrition investigations of the Office of Experiment Stations has been outlined, the plans for the work discussed, and the publications listed and described in a recent circular (U. S. Dept. Agr., Office Expt. Stas. Circ. 89).

An interesting bulletin on the influence of muscular and mental work on metabolism and the efficiency of the human body as a machine by Benedict and Carpenter (U. S. Dept. Agr., Office Expt. Stas. Bul. 208) has been published. Briefly, mental work was not found to exercise any appreciable effect on the factors of metabolism which were measured with the respiration calorimeter. As regards the effectiveness of the body as a machine, the authors calculate that it shows an efficiency of 20 per cent; that is, for every calorie of muscular work produced by the body a total of 5 calories is expended.

The reports of the Carnegie Institution for the last two years contain very interesting and valuable data regarding the installation and equipment of the Nutrition Research Laboratory at Boston, and briefly report some of the work which has been accomplished (Carnegie Inst. Washington Year Book, 6 (1907), pp. 130-133, 200-205; 7 (1908), pp. 209-212).

Benedict and Carpenter (Amer. Jour. Physiol., 24 (1909), No. 2, pp. 203-233) have reported studies of metabolism during fever, studies of the energy involved in typewriting (Jour. Biol. Chem. 6 (1909), No. 3, pp. 271-288), and some other experiments, in one of which the respiration calorimeter was used (Amer. Jour.

Physiol., 24 (1909), No. 2, pp. 187-202). Benedict (*Amer. Jour. Physiol.*, 24 (1909), No. 3, pp. 345-374, figs. 6) has also devised and described a small portable apparatus for use in respiration experiments.

An improved respiration apparatus of the Regnault and Reiset type has been perfected and described by Zuntz and Oppenheimer (*Biochem. Ztschr.*, 14 (1908), Nos. 5-6, pp. 361-368, pl. 1), and tests with it have been reported (*Ibid.* pp., 369-384, figs. 3).

Letulle and Miss Pompilian have described (*Rev. Soc. Sci. Hyg. Aliment.*, 3 (1906), No. 4, pp. 645-665, figs. 14) a respiration calorimeter different in construction from those which have been built in the United States, but as yet have not reported investigations with it.

STUDIES OF BODY TEMPERATURE.

In studies of body temperature and periodicity, Osborne (*Jour. Physiol.*, 36 (1908), No. 6, pp. XXXIX-XLI) reports data based on records kept on a journey from Melbourne to London, his results indicating in his opinion that the evening maximum in temperature takes place with regard to local time and not the time of the starting point, a conclusion which is not in harmony with the data reported as a part of the nutrition investigations at Middletown, Conn., by Benedict, who found that the habit, for a long period, of working by night and sleeping by day, did not affect periodicity in body temperature.

Kurita (*Arch. Schiffs u. Tropen Hyg.*, 11 (1907), No. 21, pp. 681-683) studied the increased body temperature observable in men working in hot climates and the amount of time required for return to normal temperature. He concludes that at least two hours' rest is essential after work has been performed where the air is excessively hot.

As a contribution to the general question of the effects of external temperature and other climatic conditions on food requirements may be mentioned Haldane's studies of work under increased atmospheric pressure and in great heat (*Sci. Prog. Twentieth Cent.*, 2 (1908), No. 7, pp. 378-398, figs. 4).

Increased body temperature and other questions concerned with body temperature were studied by Rancken (*Skand. Arch. Physiol.*, 21 (1908), Nos. 2-3, pp. 161-236, figs. 23), and Tolkowsky (*Ann. Gembloux*, 18 (1908), No. 11, pp. 638-652, figs. 2) has published a digest of data on the general subject of animal heat.

STUDIES OF THE PHYSIOLOGY OF GROWTH.

Fundamental in their importance and in their relation to questions of nutrition are the extremely valuable series of investigations on the chemistry of growth reported from the Laboratory of the Sheffield Scientific School of Yale University, by Mendel and his associates. The papers which have already appeared deal very largely with the enzymes of different tissues in embryonic life. This work appeared in volume 20-21 of the *American Journal of Physiology*, and has been summarized by the author.

Many studies of growth have also been reported by Waters (Proc. Soc. Prom. Agr., Sci., 29 (1908), pp. 71-96, figs. 5, charts 2), then of the Missouri Experiment Station, and by S. H. Gage and Miss Susanna Gage of Cornell University (Science, n. s., 28, (1908), p. 494), while recent contributions to the subject have been discussed and data summarized by Pearl, of the Maine Experiment Station (Amer. Nat., 43 (1909), No. 509, pp. 302-316).

BOOKS ON NUTRITION.

Of recent books which deal with nutrition topics mention may be made of Cohnheim's *Physiology of Digestion and Nutrition*, (Die Physiologie der Verdauung und Ernährung. Berlin and Vienna; rev. in Brit. Med. Jour., 1908, No. 2489, pp. 746, 747); Rubner's *Food Problems*, (Volksernährungsfragen. Leipsic, 1908, pp. 144; rev. in Zentbl. Physiol., 22 (1908), No. 11, pp. 349-351); and Lungwitz's *Metabolism Experiments on the Protein Requirement of the Child* (Stoffwechselversuche ueber den Eiweissbedarf des Kindes. Berlin and Halle, 1908, pp. 82; rev. in Brit. Med. Jour., 1908, No. 2489, p. 747); Cohen's *Organic Chemistry for Advanced Students* (New York and London, pp. VIII+632; and Halliburton's *Physiological Chemistry* (Ann. Rpts. Prog. Chem. [London], 4 (1907), pp. 226-260), which is a critical summary and review of investigations on the chemistry of proteids and other important questions.

Mention should also be made of the new edition of Lusk's *Science of Nutrition* (Philadelphia and London, 1909), which contains additional data and is designed to serve as a text and reference book for the student and teacher.

Fischer's summaries of investigations with carbohydrates and ferments (Untersuchungen über Kohlenhydrate und Fermente. Berlin, 1909, pp. VIII+912) are an important compilation and

summary of the numerous papers on this subject which he and his students have published. A similar volume reporting his studies on the cleavage and structure of proteids is of equal value. Schryver has also published a book entitled *The General Characters of the Proteins*, (London, New York and Calcutta, 1909, pp. X+86), which contains a large amount of information. Plimmer's series of monographs on the chemical constituents of proteins, (New York, Bombay and Calcutta, 1908, pts. 1, pp. XII+100; 2, pp. VIII+66), which summarize a large amount of data on protein chemistry, may also be mentioned.

Vernon's volume, *Intracellular Enzymes* (London, 1908, pp. XI+240), should also be noted.

A System of Diet and Dietetics, edited by G. A. Sutherland, has already been referred to (p. 60).

Snyder, long associated in the cooperative studies of bread and other cereal foods carried on under the auspices of the nutrition investigations of the Office of Experiment Stations, has prepared a text-book entitled *Human Foods* (New York, 1908, pp. 362), designed for the use of university students, in which he has summarized important data regarding human nutrition, drawing largely on the results of his own extensive investigations on the subject.

A new and enlarged edition of *Practical Dietetics*, by W. Gilman Thompson (New York and London, 1909), has appeared which like the earlier edition is an extended summary of data on diet in health and disease.

In Mohler and Eichhorn's translation of Edelmann's *Text-Book of Meat Hygiene*, (Washington, 1908, pp. XII+402, pls. 8, figs. 157), a large amount of material is summarized regarding meat inspection which is of interest to students of nutrition, particularly as it may be considered accurate as regards American conditions, Doctor Mohler having long been connected with the inspection work of the Bureau of Animal Industry of the U. S. Department of Agriculture.

MARIA DANIELL.

The death of Miss Maria Daniell occurred in Quincy, Mass., November 21, 1909. Miss Daniell was born in Boston, June 21, 1844, and was of colonial descent, tracing her ancestry back to 1636 when Robert Daniell settled in Watertown, Mass.

Miss Daniell's interest in food problems, a broader interest than that of merely preparing palatable dishes, was aroused by the lectures which her cousin, Mrs. Olive Daniell, gave at about the same time that Miss Parloa began her work (1875 to 1880). Always painstaking in her work the economic side appealed to her rather more than to any other of the leaders in this line except Juliet Corson.

The death of Miss Daniell following so soon after that of her friend and teacher Miss Maria Parloa, removes almost the last of a group of famous teachers of nineteenth century housewifery. These women deserve well of this age for saving to us some of the wisdom of the past and connecting it with the science of the present.

Miss Daniell had the gift, born in few and never really acquired, of knowing instinctively the right flavors and texture of cooked food, and she more than any other teacher of cooking gave herself to the production of the most savory viands with the least cost. She was a keen judge of the raw material as well.

She aided her cousin, Miss S. E. Wentworth, in the early days of the New England Kitchen. She had charge of the world-famous Rumford Kitchen at the Chicago Exposition and then helped to organize the dining halls of the women's dormitories at the University of Chicago. She spent a winter over the student lunch room problem at Pratt Institute, Brooklyn, N. Y. Two winters were given to the School of Housekeeping, Boston, one winter to a study of institution dietaries at Ogdensburg, N. Y., under the direction of the late Professor W. O. Atwater. Miss Daniell also spent two winters in Texas under the auspices of a woman's club association which arranged groups of towns, five in a group, for courses of lectures and demonstrations once a week. A considerable portion of the state was thus covered and greatly benefited.

At intervals she gave class instruction to nurses and medical students, while her summers were given to the health and com-

fort of the appreciative vacationist. The most notable instance was the setting a standard for the Lake Placid Club, Adirondacks, a standard it has been found hard to maintain. One of the last services to better living without extravagance was in helping to establish the College Club of Boston in its new home. Hers was a busy, varied and useful life full of cheer despite family bereavements, a life that will shed its influence long after we who knew and loved her have also passed on.—Ellen H. Richards.

Another pioneer in work for improved home conditions and better living has entered into rest. Maria Daniell was an idealist, in that perfection in the preparation and serving of food was her aim.

As manager and table director of the Lake Placid Club for five years in its early days (1897-1900) she set a standard which may well be defined as the highest art in cookery, i. e., the scientific application of heat to food in such manner as will render it most appetizing and digestible while best preserving its natural flavor. She possessed the rare gift of combining delicacy of seasoning with the instinct of right combinations of foods. Simplicity in variety each day, with perfection of each individual article of food, was her aim, and there is no doubt if this ideal were widely adopted where large numbers are fed, it would mean increased health, enjoyment of food, and efficiency.

Miss Daniell was warm hearted, sympathetic, and a loyal friend, giving most generously of time and strength wherever she could help others, often taxing unduly her physical strength. Many warm friends will hold her memory dear in this Adirondack region which she loved so well.—Annie Dewey.

Maria Daniell was more to the Lake Placid Club than its table director. The older members recalled her always with a feeling of personal friendship and welcomed her back most heartily on her visits to the Club which she had worked so hard to help build up in its early days. We were looking forward to a month's visit in January when the sudden news came. Her big warm heart made for her many friends up here in the great forest and all of us appreciate the practical service she rendered in developing the new science of Home Economics to which she had unselfishly given most of her life.—Melvil Dewey.

ON THE RELATION OF YEAST TO FLAVOR IN BREAD.^a

RUTH AIMEE WARDALL.

Bread is probably more commonly used than any other one article of food, yet there exists a great range of desirability in breads, due to several causes, but chiefly to its flavor. By the average individual the nutritive value of any food is given less importance than its flavor. We may rightly consider flavor in food as important and we may well seek the factors which give this desirable quality.

Previous work with bread in which the materials, other than yeast and flour, were varied, showed that flavor could be affected by these variations. Still another set of experiments, in which all other conditions and materials remained constant and the flour varied, showed that the flour is a most important factor in producing flavor. Among these flours were included a large number of durum wheat flours, the better varieties of which impart a characteristically delightful nutty flavor to bread.

The extent to which yeast is used in controlling flavor in beer and other fermented drinks suggests the possibility of selecting among the yeasts certain ones which may impart characteristic flavors to bread. The object of this piece of work was to discover, if possible, whether yeast in pure culture is a controlling or even an important factor in producing flavor in bread. This involves a good many questions with regard to the materials of the bread, and with regard to the nature of the yeast plant and its activities. The response of the yeast to physical conditions, its needs for nutrition and multiplication, its enzymes, its relation to other organisms, are all to be considered.

Literature.—A search through the literature on yeasts revealed at once that the work done with yeast has been primarily for the benefit of the brewer and the distiller, with the most meager reference, if any, to bread. Pasteur^b concerned himself with the origin of yeast and the phenomena of fermentation in wine and beer. Hansen^c says a man in Copenhagen "prepared a pure cultivated yeast, which is now employed in several bakehouses

^aA thesis for the degree of Master of Arts in Household Science in the Graduate School of the University of Illinois, 1907.

^bStudies on Fermentation, London, 1879.

^cPractical Studies in Fermentation, London and New York, 1896.

in place of the leaven," and dismisses the subject of bread. Many articles about yeasts are written for the different journals of the brewers. Very full of suggestion is the work of the botanists dealing with the physiology of the yeast plant,—such as Will^a and Vines^b on the proteolytic power of yeast, Beyerinck^c and many others who deal with the sugar splitting enzymes and other phases of yeast physiology.

Technique of Bread Making.—As the real and final test of any yeast or combination of yeasts, to be used in baking, must be a loaf of bread, a method of making bread was more or less arbitrarily adopted and followed throughout this work. A loaf of medium size was made from the following ingredients:

1 cup liquid, 1 tablespoon butter, 1 tablespoon sugar, $\frac{3}{4}$ teaspoon salt, 3 cups flour, and yeast.

The materials were at once mixed into a dough, put into a water oven and left to rise at a temperature of 30–40° C. When the dough doubled its bulk it was made into a loaf, put into the pans and again placed in the water oven; when its bulk doubled the second time, the loaf was baked 45 minutes at 200° C. Both the materials and the manner of handling these loaves are those commonly used in the household.

The pure culture yeasts which would make bread at all would do it in six to nine hours from the time of mixing up the dough until the bread was baked and out of the oven. These loaves of bread were regularly started in the morning, baked in the afternoon and tested the following day. In the case of a number of doughs which showed a slight tendency to rise toward the close of the day, the same culture was started in the afternoon and allowed to stand over night in the dough, but this longer time allowed for fermentation did not once result in a good loaf of bread. This is readily understood, for the yeast when introduced into the dough is in an actively growing condition, and if it has the power to ferment at all under its given conditions it does it in the shorter time. It works just as the compressed yeast does in the so-called short process bread, as opposed to the long process bread made with dry yeast.

^aStudien über Proteolyse durch Hefen. Centbl. Bakt. 2 abt. (1901), No. 7, p. 794.

^bThe Proteases of Plants, Ann. Bot., XVIII, (1904), p. 289.

^cUeber Nachweis und Verbreitung der Glukase, das Enzym der Maltose, Centbl. Bakt. [etc.] 1, (1895), No. 6, pp. 221–229.

Yeasts.—The great number of culture yeasts as well as wild yeasts known to us presents a rather formidable array to one who wishes to choose from among them certain organisms which will accomplish certain purposes. Natural fermentation in fruit juice gives an uncertain result, because the number and variety of organisms present cannot be foretold. Sometimes natural fermentation occurs in bread—as in salt-rising bread—in which the organisms in the materials, and those received from the air during manipulation are kept at a temperature favorable for the growth of certain forms, mostly if not entirely bacteria. Here as with the fruit juice the resulting product is quite uncertain.

The makers of beer and wine have learned that it is to their advantage to choose among the yeasts and to use them in pure culture. The bread maker has not felt so great need to choose his yeasts carefully and so has not investigated his yeasts so thoroughly. There are commercial laboratories which supply bakers and yeast factories with pure cultures, mostly different strains of *Saccharomyces cerevisiae*, but not all yeast factories use pure cultures. On visiting one yeast factory and inquiring about the source of their yeasts, we were told that when their commercial product became unsatisfactory some yeast was purchased of a competitor and a new 'starter' made. In this instance a conscious choice among yeasts surely did not occur. In another factory we were assured that pure cultures were used for the 'starter.'

A letter was written to the author of an article on yeasts for bread, asking his opinion about the effect of yeast on flavor in bread. The reply is quoted: "The flavor, especially of fine baked goods, may certainly be affected by the use of yeast, especially by the use of beer-yeast from which the hop-bitter-substances have not previously been extracted. The use of partially decomposed, old pressed yeast, may likewise exercise an unfavorable effect on the flavor." This does not answer the point in question at all, since it deals with commercial brands of yeast, or their condition when used, and not with the effect of the yeast itself which can be studied only in pure culture.

Description of Cultures.— The first set of yeast cultures worked with was separated from dry and compressed yeasts purchased on the market and from liquid yeasts used by house-keepers. No attempt was made to identify these cultures;

they were given laboratory numbers and records were kept under these numbers. Later, yeasts were procured from various sources, making a total of thirty-three cultures. It is, therefore, quite possible that the same species and even the same strain may appear more than once in this list of yeasts, but time would not permit both the identification of yeasts and the selecting process among them, and as the latter was the real object of investigation, the former was disregarded with the thirteen cultures separated from commercial and household samples of yeast. Nos. 21-24 inclusive, 189, 190 and 191 were separated from commercial and household samples of yeast. Of the five brewers' yeasts, two each were from two well known breweries in this country, and one from a school for brewers. Nos. 157 and 158 came from a commercial laboratory. Nos. 183-186 inclusive, were from four strains of *S. cerevisiae*, from the Boston Bio-Chemical Laboratory. Nos. 274-282 inclusive were purchased from Kral's Bacteriologisches Laboratorium, Prag, and represented the following species:

Nos. 274, *Saccharomyces farinosus* (Lindner); 275, *S. exiguus* (Rees) Hansen; 276, *S. Ludwigii* (Hansen); 277, *S. cerevisiae* Saaz; 278, *S. cerevisiae* I. Hansen; 279, *S. Pastorianus* III. Hansen; 280, *S. cerevisiae* Carlsberg I. Hansen; 281, *S. ellipsoideus* I; and 282, *S. Pastorianus* I.

Culture Material.—The manner of growing the yeasts and introducing them into bread became a matter of experiment. In making beer and wine the culture material is one that can go into the finished product, but obviously neither a wort nor must culture would do for bread, and the following culture materials were tried: (1) Milk; (2) thin corn meal gruel with two per cent glucose; (3) potato solution; (4) thin flour gruel; (5) two per cent glucose solution in water; (6) two per cent cane sugar solution in water; (7) No. 3 with two per cent cane sugar; and (8) No. 3 with two per cent glucose. A decided preference was shown by the yeasts for No. 8.

The potato solution was prepared by cooking and mashing 100 gms. of potato, and making the volume up to 400 cc. with water. A measured portion was put into sterile flasks and sterilized for use in bread. A sub-culture of the yeast to be tested was made on a bouillon or wort agar slant and grown in the incubator at 29-30° C. for twenty-four hours. From this the potato solution

in the glass flask was inoculated and left in the incubator for twenty-four hours, when it was used for bread. Sometimes these flasks had a decided froth due to gas formation, sometimes very little indication of gas was seen, and sometimes none, but this could not be taken as a sure evidence of the activity of the yeast in bread. In the case of some of the brewers' yeasts a decided gas formation occurred in the potato solution, but the doughs remained perfectly flat. After the yeast had been twenty four hours in the potato solution, and was ready to be used in bread, enough water which had been boiled was added to the solution to make up the measure of liquid required for the bread and the dough mixed as for any bread.

Requisites of a Bread Yeast.—The first requisite for a yeast to be used in making bread is the ability to set up a fermentation sufficiently active to afford enough gas to make the bread light, and to do this in a reasonable length of time. The ability to set up fermentation depends on at least three things,—the enzymes of the organism, the character of the material in which it is, and the temperature. It is not difficult to supply a favorable temperature, and probably it would not be difficult to supply a favorable medium for the yeast if only its enzymes were fully understood. With all conditions favorable some yeasts induce a quicker and more powerful fermentation than others, and this activity makes another condition in the choice of yeasts for bread.

Gas Formation and Bread Making.—Table I shows the relative gas production and resulting quality of the bread with a few of the cultures used. This fermentation was measured in a two per cent glucose bouillon.

TABLE I.—RELATIVE GAS PRODUCTION OF YEASTS AND COMPARATIVE QUALITY OF THE BREADS PRODUCED.

Lab. No.	Per cent of gas produced.			Quality of Breads.
	24 hrs.	8 hrs.	72 hrs.	
21	0	22		Odor and flavor rather good. Not light.
22	0	5	40	Poor texture. Not light.
23	0	0	0	Did not rise.
25	0	35	60	Good bread.
33	0	0	0	Did not rise.
38	15	30		Excellent bread.
40	12	80		" "

It is not surprising that there is a distinct correspondence between gas production and the quality of the bread. Some

yeasts which failed in bread did not raise the doughs in the slightest degree. Others caused a slight increase in the bulk, but they were either too slow or too weak to make them desirable for bread.

Table 2 gives the comparative results with the pure and mixed yeasts in bread making.

TABLE 2.—RESULTS OF BREAD-MAKING EXPERIMENTS WITH PURE AND MIXED YEASTS.

Lab. No. of Yeast	Source of Yeast.	Flavor of Bread.	Lightness and texture.	Comments.
21	Commercial	Rather good	Very poor	.....
22	"	"	"	Not worth baking
23	"	"	"	" " "
25	"	Excellent	Good	.....
27	Household	"	"	Not worth baking
28	"	"	"	" " "
33	Commercial	"	"	.....
38	"	Excellent	Excellent	.....
40	"	"	"	.....
41	"	Not bad	Very bad	.....
85	Brewers' yeast	"	"	Not worth baking
92	" "	"	Perfectly flat	" " "
94	" "	"	"	" " "
155	" "	Good	Rather poor	.....
156	" "	"	Not very good	.....
157	Com. Lab.	"	Good	.....
158	" "	"	Fairly good	.....
183	" "	"	Fair	.....
184	" "	"	"	.....
185	" "	"	Good	.....
186	" "	"	Fair	.....
189	Commercial	"	Good	Would not make brea
190	Same as 189	"	"	" " " "
191	"	"	"	" " " "
274	Com. Lab.	"	"	" " " "
275	" "	Not bad	Very poor	.....
276	" "	"	"	.....
277	" "	"	"	.....
278	" "	Very good	Not very good	Would not make brea
279	" "	"	"	Would not make brea
280	" "	"	"	" " " "
281	" "	Very good	Fairly good	.....
282	" "	"	"	Would not make brea

This table shows that only a very few of the pure cultures produced a good loaf of bread. Among the possible causes of this failure are the lack of a culture medium suited to the yeast

in question, feeble fermentative power of the yeast, or a possible lack of symbiotic relations with some other organism.

Symbiotic or Associative Action.—In the spirit industry pure cultures of lactic acid bacteria are added to the mash, so preventing the development of injurious organisms and as Jorgensen^a says “exerting an influence on the yeast-cells, both direct and by reacting on the nutritive substances.” By some the presence of lactic acid bacteria in compressed yeast is considered desirable. Whether this does any more than act as a germicide and so help the yeast gain the ascendancy in bread is a question. There may be an associative if not a symbiotic action.

From a commercial sample of yeast, separation plates were made on wort agar and gelatin, and on potato agar and gelatin. Cultures Nos. 189, 190 and 191 of Table II were characteristic in all. These were tried separately and in all the possible combinations, but No. 189 was the only one which would make a loaf of bread alone, and only the combinations in which it was present resulted successfully. This was the only attempt to discover symbiotic action, but similar trials might well be made. Usually a plate from a yeast cake will contain bacterial colonies and it may be that these sometimes have a part to play in the bread making. In this case there was apparently no symbiotic action, for neither texture nor flavor seemed to be at all different in the combination of cultures than with No. 189 alone. The presence of these three distinct types in the yeast cakes of this particular brand of commercial yeast may have been purely accidental. It hardly seems possible that they were all there for a specific purpose, else the results of the separation and handling in pure culture would have shown it. Still the manufacturer of this special yeast assured us that he understood the value of pure cultures and that he could not discuss symbiotic action with us without betraying his trade secrets.

Top and Bottom Yeasts.—There is a prevalent belief and expression that the brewers' yeasts, which are pretty generally bottom yeasts, will not make bread, and that the distillers' yeasts, typical top yeasts, are better adapted to the bread making process. Experience seems to bear out this belief, but the reasons assigned are not altogether satisfactory. Of the five

^aMicro-Organisms and Fermentation, London, 1900, page 72.

brewers' yeasts tried, three were complete failures in bread, and the remainder made only fair bread. Among the last nine cultures listed in the table there are both bottom and top yeasts. No. 281 which makes good bread, and the best of any member of this group, is a typical bottom yeast, whereas No. 282, which is also a bottom yeast, fails entirely in bread. No. 279, a typical top yeast, makes poor bread; No. 278 also, a top yeast, is a failure in bread. According to Prior the fermenting power of *S. elipsoideus* I. (No. 281), is greater than that of either Nos. 279 or 282, measuring the activity by the weight of carbonic acid liberated by a given amount of yeast, from a given sugar solution, at a given temperature, and in a given time. There seems to be no one characteristic which will hold for a dividing line between bottom and top fermenting yeasts except the phenomenon that the one appears on the surface and the other at the bottom of the fermenting liquid. The temperature favorable to top yeasts is nearer that of the ordinary handling of bread in the household than is the very low temperature used for bottom yeasts, and this may be a partial explanation for the failure of the latter. Still one of the best bread yeasts in these experiments is a bottom yeast and was cultivated along with the other yeasts at 30° C. With two of the brewers' yeasts, which failed to make bread in the regular way, a range of temperatures was tried in the bread making to see if the optimum could be found, but no one temperature seemed more favorable than another. Viewig^a says, "A good leavening should have not only a high initial fermenting power, but should continue to generate carbonic acid after the dough is placed into the bake oven, and until its temperature reaches 50° C. or over; and this 'oven leavening' quality is an important factor in determining the size and shape of the finished product. For this reason the bottom fermentation yeasts, which are very sensitive to higher temperatures, do not meet the requirements of a high-class leavening yeast; and while successful attempts have been made to adapt this type of yeast to higher temperatures it is questionable whether it retains its character as a good brewer's yeast."

Enzymes of Yeast.—A thorough understanding of the enzymes of yeast may throw a good deal of light on the whole bread

^a*Pure Products*, 2 (1906), No. 4, page 188.

question, and to the understanding of these might well be added an understanding of the enzymes of the flour. The enzymes of yeast which probably are most influential in bread making are those acting on the different sugars, invertase and zymase. Whether the slow acting proteolytic enzymes of yeast really enter the problem of bread making seems doubtful. Considering the enzyme content of yeast a good many suggestions are made as to a favorable culture material, but it was felt in this case that the ordinary materials, which the housewife might reasonably be expected to avail herself of, should be tried first. Since yeasts may be grouped according to their power to ferment different sugars, it is evident that variation in sugars might be made to the advantage of the yeast with no one medium the optimum for all. This, of course, would necessitate the use of materials foreign to the ordinary household and would be of no importance in a practical way. In these experiments glucose, however, was used in the culture material because it is the sugar most generally fermented by yeasts, though in the bread mixture cane sugar was used. The latter is of course the more common in the household and is inverted by the majority of yeasts.

Diastatic Action.—These seems to be a question as to how much diastatic action the yeast exerts in saccharifying starch, and as to how much sugar really undergoes alcoholic fermentation in the bread making process, and whether this varies materially in the various ways of making bread. Along this line some chemical analyses might be made with profit. It is a common custom to make bread without adding sugar to the dough, in which case there must be assumed either a diastatic action on the part of the yeast or the flour, or enough sugar in the flour to keep up fermentation, and the latter is not probable. The diastatic action of flour is often spoken of as playing an important part in the bread making, but repeated failures to rise of doughs, into which pure cultures of yeast have been put, do not incline one to the belief that the flour diastase has played an appreciable part in the doughs which have become light.

A series of tests was run to learn something of the diastatic power of the yeasts. Agar was added to a two per cent soluble potato starch solution and plates made. These were streaked with the different yeasts and left four to eight days in the incubator, then the plates were flooded with iodine and examined to

discover if there were any diffusion areas along the streaks. In several plates there were slight clear areas. Check tests were made with a plate streaked with a commercial sample of compressed yeast, but the results were so nearly negative in all cases that they were deemed not worth tabulating.

In an attempt to make a somewhat more exact test for diastatic activity, 5 cc. of a 2 per cent soluble potato starch solution was put into test-tubes and sterilized; these tubes were then inoculated with the pure yeast cultures and left in the incubator at 30° C. from four to eight days. At the end of this time a measured quantity of iodine of known strength was added to these tubes as well as to a check tube and the depth of color compared. In practically all cases there was a reddish tinge to the blue, showing that some change had taken place in the starch, but the variations from the starch control tube were very slight. How the result would have been modified by adding some proteid food for the yeast was not determined.

This apparently feeble and slow activity of the diastase seemed rather surprising. Dr. H. Stiegeler^a says "Some yeasts contain only traces of diastatic ferments and brewers' yeast is entirely free from them." Viewig^b, mentions the sensitiveness of bottom yeasts to temperature and adds, "Another defect of the brewer's yeasts is their lack of diastatic ferments. As the low percentage of sugars normally contained in flour is rapidly fermented, the dough would rapidly collapse were it not for the presence of diastatic enzymes which continually furnish fresh supplies of sugar to the yeast. The main trouble arising from the use of brewers' yeast is due to the almost entire absence of diastatic enzymes."

These remarks suggest a possible reason for the failure of some yeasts, and the common practice of the bakers in adding malt extract to bread seems a confirmation of this view.

Malt Extract in Bread.—In an effort to discover whether lack of diastatic action was the cause of failure of these yeasts in bread, malt extract was freshly prepared and added to the dough. In a preliminary test with malt extract in compressed yeast bread, loaf No. 1 (check) received no extract, No. 2, 1.5 cc., No. 3, 3 cc., No. 4, 6 cc. and No. 5, 12 cc. These loaves formed

^aPure Products 1 (1905), No. 6, p. 290.

^bLoc. cit.

a progressive series, the first three being very good and the last two less desirable, though fairly good bread. Loaf No. 2 was perceptibly whiter than No. 1 and of finer texture. Loaf No. 3 was the whitest loaf of all, and of the best texture. No. 4 was less white than No. 3, of coarser texture, and a little sticky. No. 5 was darker than No. 4, of still coarser texture, very sticky, readily fell apart and dissolved in the mouth. The volume increased from Nos. 1 to 3, then decreasing again to No. 5 which had a slightly greater volume than No. 1.

The strength of the extract was determined by its action on a one per cent soluble starch solution. Five cc. of the starch solution with 0.5 cc. of the extract gave no color reaction to iodine after 10 minutes. The proportion of extract in loaf No. 4 was used for the pure culture loaves, in the belief that what would be a slight excess of extract with yeast itself capable of making bread would be enough to furnish the necessary diastase for a yeast in which diastase was lacking, and which failed in bread because of this lack. The bakers claim that the malt hastens the process of fermentation and is a cheaper source of sugar than cane sugar. One objection mentioned to its use is that while fermentation proceeds more quickly, the liability to souring is also greater if the dough is not watched very carefully and handled promptly. In this series of loaves with malt extract the slow yeasts gave a sour loaf of bread on standing ten hours, a thing which never occurred in the pure culture bread without malt extract, when doughs frequently stood for twenty-four hours without souring in the slightest degree.

A similar but more extended series of tests was also made, the results of which are given in Table 3, on page 87.

Proteolytic Action of Yeast.—Viewig^a says "brewer's yeast secretes a larger proportion of trypsin than does the compressed yeast, and since trypsin has the power of cleaving proteids, the glutenin of the dough becomes softened to such an extent that it fails to retain the liberated carbonic acid; whereas, under the influence of compressed yeast, the glutenin remains tough and effectively resists the escape of the carbonic acid formed." Vines^b showed that in *S. cerevisiae* both a peptonizing and a

^aLoc. cit.
^bLoc. cit.

peptolytic enzyme exist as shown in his experiments in autolysis, in digestion of Witte-peptone and of fibrin by the yeast.

The proteolytic activity of any yeast could be determined by testing for cleavage products, and this is the only way of really knowing what takes place. Viewig's explanation, if true, might throw light on a good many failures of yeast in bread. A rough test of his statement was made by mixing the dough for bread in the usual manner and allowing it to rise as if it were to be baked or, in cases of doughs which would not become light, allowing them to stand until the others were light. Instead of baking the doughs the gluten was washed out of them and baked. The glutens were found to differ among themselves scarcely at all. All were elastic and strong, and on baking all were well expanded and resembled a fresh bit of gluten just washed from the flour and baked. In many cases a second portion of the same dough was allowed to stand until the following day, but the gluten from this portion seemed not at all different from that of the first portion on the preceding day. Two checks were run for these, one without any yeast, and one with compressed yeast. All of the yeasts in Table 2 were put into doughs and the gluten tested,—among them a number of brewers' yeasts. It would seem that if the failure to make bread were due to the proteolytic action of the yeast on the glutenin, the gluten washed out should give some evidence of change.

Supply of Inorganic Nitrogen.—With the yeasts which failed to make bread in the glucose potato medium, as well as with some which succeeded, a trial was made in which one per cent ammonium tartrate was added to the potato medium in order to afford some inorganic nitrogen. This did not seem to furnish what was needed for the yeasts which had already failed in bread as may be seen in Table 3. In every loaf of bread with ammonium tartrate there resulted a closer, finer texture and a whiter color, but the flavor was never improved. In fact there was a slightly unpleasant taste, after chewing it a minute, the same that one frequently gets in some baker's bread.

Persistence of Yeast Characteristics.—Yeasts differ among themselves in response to physical conditions, in enzyme content and power to ferment. Numerous trials have been made to convert a top-fermenting yeast into a bottom-fermenting yeast as well as the reverse process. Changes have been brought

TABLE 3.—COMPARATIVE TESTS OF YEASTS AND EITHER MALT EXTRACT OR AMMONIUM TARTRATE FOR BREAD MAKING.

Lab. No. of Yeast.	Plain Bread	Bread with malt extract.	Bread with ammonium tartrate.
21	Poor	Very poor	Failure
22	Failure	Failure	"
23	"	"	"
25	Excellent	Good	.....
27	Failure	Failure	Failure
28	"	"	"
33	"	"	.....
38	Excellent	Good	.....
40	"	"	.....
41	Very poor	"	.....
85	Failure	Failure	Failure
92	"	"	"
94	"	"	"
155	Poor	Very poor	Very poor
156	"	Failure	Failure
157	Fair	Fair	Good to see, not to eat
158	"	"	" " " "
183	"	"	Good color and texture, poor flavor
184	"	"	" " " " " "
185	"	"	" " " " " "
186	"	"	Very poor
189	Good	"	.....
190	Failure	Failure	Failure
191	"	"	"
274	"	"	"
275	Very poor	"	Poor
276	"	"	Failure
277	Failure	Poor	"
278	Poor	Failure	"
279	Poor	Poor	Poor
279	Failure	Poor	Failure
280	"	Failure	"
281	Good	"	Rather poor
282	Failure	Poor	"
		Failure	"

about in spore and film formation, but the results of these trials seem rather conflicting. While the enzymes vary greatly in different yeasts, Klöcker^a says that one of the most constant characteristics for any given yeast is its enzyme content. Throughout this work with yeasts the accuracy with which cultures duplicated themselves in bread was remarkable, even after several months cultivation on a bouillon or wort agar slant. With a pure culture the resulting bread can be counted on with considerable assurance.

^aFermentation Organisms, London and New York, 1903.

Amount of Yeast in Bread.—To gain some idea of the effect of differing amounts of yeast, loaves of bread were made with the same materials used for pure culture bread with the exception of the yeast. In all the tests the compressed yeast cakes were moulded together to insure uniform sampling.

In Experiment No. 1, a series of four loaves was made in which the first had much less than one cake of ordinary compressed yeast, and the last had somewhat less than two cakes. These formed a progressive series, the color, grain and texture improving with the amount of yeast.

In Experiment 2, three loaves were made using respectively 9, 18 and 27 gms. of compressed yeast, the smallest amount being far more than is ordinarily used in household methods. These loaves made a consistent series, the desirability increasing with the amount of yeast; the texture of the last was best of all.

In Experiment 3, four loaves were made with yeast in the ratio 1, 2, 4, 8, loaf No. 1 receiving 12.69 gms. compressed yeast, No. 2, 25.38 gms., No. 3, 50.76 gms. and No. 4, 101.52 gms. Loaf No. 1 contained a little more than one compressed yeast cake, and No. 4 more than nine cakes. These formed a well graded series in color and texture, No. 1 being creamy white, firm and not crumbly, No. 2, somewhat whiter and crumbling to some extent, No. 3, still whiter, crumbly, squeezing almost together and rebounding with good gas distribution, and No. 4, grayish white, excessively crumbly and elastic and with good gas distribution. The flavor of Nos. 1 and 2 was very good; Nos. 3 and 4 had no taste of yeast, as in the so-called 'yeasty' bread, but they lacked entirely any flavor of the grain and were rather tasteless although edible.

In loaf No. 1 of Experiment 4, was used 10 gms. compressed yeast and in No. 2, 20 gms., so that both had yeast far in excess of household practice. Both were good and there was very slight difference in them. Experiment 5 was a duplication of the previous experiment, except that the dough was mixed in the evening. By the next morning both loaves had risen and fallen. Both made good looking bread, but were sour.

In Experiment 6, loaf No. 1 received 1 gm. of compressed yeast, No. 2, 2.5 gms. and No. 3, 5 gms. The loaves were mixed in the evening, as in experiment No. 5, and in the morning were in good condition. No. 3 was the lightest, most elastic, and had the best texture. It will be noted that while the method of procedure

was the same as in the previous experiment the quantity of yeast used was much less.

From these tests it would seem that the limits in the amount of yeast are far apart, all the way from 1.0 to 101.52 g. in a loaf of ordinary size resulting in bread good enough to eat. The amount of yeast and time required are in inverse ratio. The texture changes, improving with the amount of yeast to a certain point, then becoming poorer, but the secret of flavor in bread is surely not to be found in the amount of yeast used.

Acidity in Bread.—It is well known that the quicker the dough becomes light the less apt it is to be sour, and that the rate of fermentation increases with the amount of yeast used.

Damaged flour will cause acidity in bread, but free acid is the product largely of fermentative action in the dough. To learn something of the reaction of the pure culture breads some tests were made, in which the quantity of normal sodium hydroxide required to neutralize 100 gms. of the crumb of bread served as a measure of the acidity of the bread.

According to Lehmann, when 100 gms. of the fresh crumb require 1-2 cc. normal alkali, there results a sweet loaf; 2-4 cc., one very slightly sour; 4-7 cc., one slightly sour; 7-10 cc., one fairly sour; 10-15 cc., one strongly acid; and 15-20 cc., one excessively acid. The pure culture breads, characteristically sweet to the taste, naturally showed little acidity when titrated with caustic soda, but the results with a few were as follows: Baker's bread, 7.0 cc. normal Na OH; bread with yeast No. 156, 3.2 cc.; No. 157, 3.6 cc.; No. 183, 1.5 cc.; No. 184, 2.0 cc.; No. 185, 2.8 cc.; No. 186, 1.5 cc.; and No. 189, 2.0 cc.

Conclusions.—Table 2 shows that with the method adopted for cultivation and making into bread, the vast majority of the yeasts failed. The experiments shown in Table 3 seem to indicate that the failure is not due to the lack of diastase else the addition of malt extract would have made an improvement. The experiments also seem to indicate that failure is not due to the cleavage of the glutenin, else the gluten would have shown some physical sign of the change. These gluten tests do not at all disprove a proteolytic enzyme, but do they not show that the cause of the failure of the bread is not in a gluten so broken down that it fails physically to retain carbonic acid? The proteolytic enzymes of yeast are slow in acting and it is probable that in the short

time consumed in the fermentation of bread the proteolytic cleavage is so small that it plays no part in the bread problem. Table 3 also shows that supply of inorganic nitrogen does not improve the activity of the yeast, and that the change made in the bread is only along the line of catering to a false standard of quality in bread,—whiteness and close, fine texture.

Table 1 shows the close correspondence between the gas production of the yeast and the quality of the resulting bread. So far as we know the question of gas production is the chief factor in the selection of yeast for bread making. Both in the bakeshop and in the home the yeast which will quickly make a light loaf of bread is sought, and what other possible effects the yeasts might produce in bread are at present little considered.

The results from handling and selecting from thirty-three cultures of yeast, eighteen of which were known and the others unidentified, inclines us to the belief that flavor in bread is not to be determined by yeast, possibly not even affected by it. If it were possible to supply a culture material suitable both for the yeast and the bread we might find that some of the yeasts which now fail in bread would succeed, and otherwise we cannot, of course, be assured as to their possible effect upon flavor. From a knowledge of the individual yeast gained by experimenting a favorable culture material might be prepared, but if the yeast is to serve as a ferment for bread the material must be one which will not impair the taste or healthfulness of the bread; and if it is really to be useful, must not require anything which is unusual or difficult for the housewife to obtain.

The simple process of selection as we have carried it on might be extended over a far greater number of yeasts, and from the number which fail here some might be found which under other conditions would be successful in bread. If there were any difference in flavor among those which have successfully fermented bread a greater stimulus would be given for further search among the yeasts.

Since for obvious reasons the time allotted for fermenting bread is short it seems quite possible that an insufficient opportunity to develop flavor is given. The potato flasks after twenty-four hours in the incubator give no ethereal odor such as the wine maker detects in his must cultures.

In no case, either of the yeasts which failed to make bread or those which succeeded, was there any suggestion of sourness or any unpleasant taste. The yeasts which successfully fermented bread gave excellent loaves, which were noticeably sweet and of fine flavor; but differing so little among themselves that very slight, if any, difference could be detected on even the most critical tasting. Among the yeasts examined there seems to be no choice on the ground of producing flavor in bread.

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JELLY MAKING.¹

The object of the experiments reported was to determine as exactly as possible the conditions necessary for the formation of fruit jellies. The effect of adding sugar and organic acids to fruit juices in jelly making was studied as well as the relation of boiling point and specific gravity, and the possibility of making jelly of good texture from an artificial fruit juice made of tartaric acid, sugar, and pectin isolated from fruits. The work was conducted with fall fruits only.

The author concludes that the necessary constituents of a jelly making fruit juice are (a) pectin and (b) acid. That acid is necessary was shown negatively by neutralizing the acids of crab-apple and grape juices with tenth-normal sodium hydroxide, following which no jelly could be obtained, and positively by the addition of organic acids to sweet apple, pear and peach juices, which thereupon yielded jellies of very fair quality, though of altered flavor.

Cane sugar was found to be a desirable accessory constituent, though glycerine was substituted in crab apple jellies and yielded a product of excellent texture, fair taste and remarkable keeping qualities. Jellies were also made by boiling down fruit juices without sugar, but about six times the quantity of juice was necessary and the texture was very tough. On the other hand it seems probable that using too much sugar is a most frequent cause of failure in jelly making. The exact proportion of sugar to juice is somewhat difficult to determine, but the results indicate that it depends more upon the proportion of pectin present than upon any other one factor. If too much sugar is used, the pectin is unable to form a jelly which will completely fill the volume of liquid, hence a soft mass results. This is particularly liable to occur through overdilution of the fruit juice in the extraction process as this leads to the use of an excess of sugar. When once an over-proportion of sugar to juice had been used, no amount of boiling would remedy the difficulty, but the addition to the material of an equal volume of fresh juice yielded, upon boiling, a jelly of very good texture though of impaired color.

¹A digest of the following articles by Miss Nellie E. Goldthwaite, Ph.D., of the Research Laboratory of the Department of Household Science, University of Illinois: Contribution on the Chemistry and Physics of Jelly Making, *J. Indust. and Eng. Chem.* 1 (1909) No. 6, pp. 333-340; The Secret of Good Jelly, *Good Housekeeping* (1909) pp. 92-95.

Regarding the amount of inversion of the cane sugar during the process, some inversion is deemed desirable, but this should not approach completeness. "So far as our researches now extend it seems better not to boil sugar and juice together from start to finish in jelly-making, but rather to add the sugar so that it may be boiled with the juice for a period not to exceed one-half the total time of cooking. However, we wish to investigate this point further."

The physical constants of hot juice ready to jelly were determined as substantially, boiling point 103°C . and specific gravity 1.28.

With reference to the production of artificial jelly, the author states that jelly of excellent quality was easily prepared from a 1 per cent solution of pectin (isolated from fruit juices by means of alcohol) and 0.5 per cent solution of tartaric acid, adding to the mixture heated to boiling, $\frac{3}{4}$ volume of sugar, and continuing the boiling until jelly was formed on testing. "The total time of boiling did not exceed 15 minutes. Jellies made as above were nearly colorless, but were excellent in texture and taste. When a few cubic centimeters of grape-juice were added to the pectin solution the color of the jellies was very pleasing. That these jellies were not made directly from fruit-juice would not be suspected from taste or texture. Jellies equally good were made in this way from pectin from sweet apples, crab apples and peaches. This last fact would seem to indicate that the pectin of peaches does not differ materially, at least from a practical standpoint, from that of other jelly-making fruits.

"It may be of interest to add that pectin was extracted from jelly (the jelly being previously dissolved in an equal volume of water) by the method used for extracting pectin from fruit juices. This pectin apparently corresponded in its physical and chemical characteristics with that extracted directly from fruit-juices. Good fruit jelly invariably gives the alcohol test for pectin. These facts would seem to indicate that pectin in the formation of jelly does not undergo any deep-seated change, but rather that the phenomenon of jelly-making is more nearly physical than chemical."

Stated briefly, jelly-making, in the opinion of the author, "seems to consist in so controlling conditions by means of acid and sugar and boiling as to cause the pectin to be precipitated in a continuous mass throughout the volume allotted to it."

CONFIRMATION OF THE WORK OF MISS SNOW ON THE BOILING OF SUGAR WITH FRUIT,

EDNA D. DAY.

Department of Home Economics, University of Missouri.

Before having had time to read the June number of the JOURNAL OF HOME ECONOMICS, on my return this fall I set my advanced food class to work on the problem as to the time of adding sugar in the cooking of acid fruit. Careful experiments were tried (1) comparing the sweetness of solutions of the same strength of cane sugar and a mixture of levulose and dextrose; and (2) cooking cranberries, grapes and apples and adding the sugar at the beginning and at the end of the cooking. Our methods were the same as those of Miss Snow, except that we did not try to determine the acid or sugar content of the fruit, and that we used cranberries and grapes as well as apples.

My class reached the same conclusions as Miss Snow:

(1) That invert sugar is less sweet than cane sugar; (2) that in cooking such fruits as apples, cranberries and grapes, while the product is slightly less sweet if the sugar is added at the beginning than it is if it is added at the end, still the difference is too small to be of practical importance.

An English Experiment in Colonization.

A recent number of the *Canterbury Agricultural and Pastoral Association's Journal* contains an account of a successful experiment, conducted by the Children's Home Association of England, in receiving "poor children for upbringing in such parts of English colonies as provided wholesome surroundings, good educational advantages, and an invigorating climate." For this purpose the association purchased a farm in New Brunswick, Canada, in April, 1906. It is 15 miles from St. John's, close to a primary school, and within reach of secondary schools. There is accommodation for 20 children and 3 officials. Two women, one a trained nurse, are in charge of the children. The older girls are taught cooking, washing, and practical housework. The farm is worked by a Canadian farmer who, teaches the older boys practical work, and is superintended by a committee of local Canadian men and women. The cooperation of the Canadian Government has greatly assisted the enterprise. When old enough the boys and girls obtain work on neighboring farms. Great care is taken in selecting the employers. The cost of maintenance is from \$77 to \$116 per annum for each child.

TRAVELING COOKING SCHOOLS.

Commenting on the article on traveling cooking schools which appears in the April number of this JOURNAL, a recent number of the *Wisconsin Farmer* contains the following:

"Special trains have been run through the farming districts of the corn belt district to instruct farmers how to grow more and better corn, oats and wheat; how to increase the dairy output; how to build and maintain good roads; how to increase and improve the yield of the orchard. Why not a special train to teach farmers' wives and daughters the latest and most approved methods of cooking?"

"The suggestion is not one to laugh at. In fact, it is simply a suggestion borrowed from the actual experience of Germany. where traveling cooking schools have met with wonderful success. Not content with establishing rural schools where farmers' daughters may learn the domestic arts, Germany has instituted the cooking school on wheels, running it to the very kitchen door of the farmer's house."

"America has not gone so far, nevertheless it has done more along this line than the average person thinks. At the national apple show, held in the Northwest last fall, daily demonstrations were given in preparing and serving apples as food in 300 different manners. These demonstrations were conducted by skilled domestic economists from the state agricultural college. At the Iowa State Fair this year one of the unique attractions was a daily cooking school conducted by experts, with free instruction given to farm girls and women. Other states are doing likewise, while the domestic economy classes at all the agricultural colleges are largely attended and productive of much good.

"But the situation in America, as regards ability to attend school and colleges, is not materially different from the situation in Germany. There are thousands of women and girls who cannot quit their housework even for a week's training at the state fairs. These women are unaware of a dozen ways in which field corn may be served as palatable, delicious food. There are dishes made of rolled oats with which they are unfamiliar. Wheat is to them a material for the baking of bread or biscuit, and but little else. There is not a grain or vegetable product of the farm but can be prepared as food in a dozen or score of ways with which the average housewife—whether she lives in the city or on the farm—is unfamiliar."

EDITORIAL.

The Second Annual Meeting.

A twelve month ago the American Association of Home Economics was formed in Washington with a membership of 700; its second annual meeting held in Boston during the past Christmas holidays increased the roll call to 1,300. So rapid an increase in membership would seem to afford proof that a real need of the members was being met by the meetings of the Association and the JOURNAL which is its organ.

This second annual meeting will be long remembered. Whether in the future any other city can so honor the draft made on it for a cordial reception and help on the program seems just now quite impossible to those who were present.

We call attention to the reports of the meeting presented elsewhere in this issue as proof of the wide range of topics treated. What characterized the meeting and what, we hope, will characterize all future meetings, was the prominence given to the application of the results of scientific work to all the practical problems that engage the teacher, the dietitian, the housewife and the social worker. The opening papers on the Sciences in relation to Home Economics Courses were given by men of solid attainments, each in his field; all the speakers insisted on the thorough training of teachers of Home Economics in the basic sciences, while the excellent illustrations they furnished as to the bearing of these sciences on the affairs of daily life convinced also the listening layman that the time has come when man in order to conquer his environment and develop out of it a successful life, must obtain help from the careful and minute study of practical questions by the methods of exact science, whether the problem be that of the kitchen fire, the building of his house or the selection of his food and clothing.

Another group of scientific papers filled the evening of Friday, when the topic presented was Recent Progress in the Study of Nutrition in Relation to Dietetics. The presentation of this subject by three specialists of national repute was most instructive, giving as it did a lucid statement of the certainties in this field and revealing, what was, perhaps, of still greater importance to the students and teachers who listened, a view of the patient methods by which results are reached and

putting them *en rapport* with the scientific habit of mind which fronts the unsolved problem with unabated interest and refuses to draw conclusions without sufficient data.

Those who take more satisfaction in certainties than in possibilities, who long unspeakably that today's path may be straightened, must have seized with avidity on one statement made early in the first session: "Notwithstanding the dearth of knowledge in certain fields it may be truly said that not a tithe of the discoveries of science have yet been applied to the improvement of practical methods and processes that affect daily life."

Our best wishes go out to the scientist who heeds not the call of today and tomorrow, his eye on a fair future that has no date. May the year develop an abundant crop of those skilled in the application of existing truth to the needs of daily life.

**The
Bacteria
Scare.**

There is a rare form of insanity known to physicians in which the patient is forever washing his hands and fancying that he is polluted by every contact. A few years ago when we were at the beginning of our fight against tuberculosis, typhoid fever and other diseases that may be carried in various forms of filth, it seemed that a mild epidemic of this form of insanity would be a blessing to any community, as it would insure the clean hands which must be insisted upon if we are to have clean food. However, when one sees the wholesale and often unwarranted application of a little knowledge of bacteria to every phase of life one is thankful for all the existing sanity and desirous of its extension. For in the wake of every reform is found the trail of the extremist. The Journal of the American Medical Association calls attention in a late issue to certain statements in a book entitled *Good Health and How We Won It*, by Mr. Upton Sinclair and Mr. Michael Williams. It seems that the writers recovered their health by decreasing the amount of their food and omitting meat entirely. We do not hear as a reason that these gentlemen felt that they were approaching middle life when just this change in the diet has frequently been recommended by physicians though for reasons unconnected with bacteria; they say they have abandoned eating of meat because of the great numbers of bacteria that it contains, there being it is claimed hundreds of millions of bacteria in different cuts of beef steak and several varieties of sausage.

It is said that every form of error may be traced to faulty logic; here the trouble seems to be that the premises are false. "Meat contains many bacteria. All bacteria are harmful, therefore, etc." The investigators do not state the kind of bacteria nor the way they came to be present in the meat, and evidently they believe that meat in and of itself is naturally and normally laden with these minute forms of life. As a matter of fact though results of a different character have been reported not infrequently, carefully made and carefully controlled laboratory work with all precautions taken has shown that the raw flesh of healthy animals is sterile and only in certain animal diseases is bacterial life present in the tissues.

All living things, both plants and animals, are subject to bacterial diseases, but if bacteria are found on raw or cooked meat from healthy animals it is safe to say that they were lodged there by passing air currents just as they are lodged on any other food thus exposed. Rightly interpreted then, the laboratory experiments indicate that all foods should be protected from accidental contamination by bacteria, as harmful species may be present among them, not that meat should be excluded from the diet because bacteria happen to be found on it.

A very few bacteria, not more than 50 or 60 species, are known to be harmful, many are known to serve a useful function and it is thought that some varieties may even prove to be necessary to the digestive processes. The intestinal tract of man swarms with bacteria, and the experimenter has never been able to free from bacteria the digestive tract of an animal that has once lived under normal conditions. Of the foods we eat there are absolutely none free from bacteria, if we except cooked food fresh from the fire. The purest milk obtainable for the table contains thousands of bacteria to the cubic centimeter, while commercial milk may have many millions. Buttermilk and other forms of acid milk also contain correspondingly large numbers. Many hundreds of these harmless bacteria are known and named, while the harmful or pathogenic bacteria number only a few score. It is these few malevolent microbes that must be avoided, and hence all the precautions we have adopted as to cleanliness in hospital, market, dairy, and kitchen. But if life is to be worth living we must learn where these objectionable varieties come from in order to con-

concentrate at the proper place our use of that eternal vigilance which is the price of health.

Here are a few suggestions. Human contact with food is probably the greatest source of danger. If a piece of dry bread fall on the floor of a clean private house the bacteriologist tells us it might be picked up and eaten with impunity. Not so if this bread were to be dropped on the floor of a trolley car, especially in the old days when expectoration was common. The driver's hand which grasps the top of the milk bottle which he delivers may leave bacteria there and the bottle should be washed before the milk is poured out. The diminishing of the number of bacteria in our food by the practice of cleanly habits (and no one of these habits is more important than the thorough washing of the hands before handling and preparing food and before meals) is recommended by all hygienists; but there should be no morbid fear of the consumption of foods that have been the dependence of the race since the dawn of civilization and before, simply because we do not ordinarily eliminate from them every trace of bacterial life.

**Women's
Institutes
in Ontario.**

Of great interest is the report of the Women's Institutes of the Province of Ontario recently issued. In part II of the report is given a complete list of the meetings to be held in the different parts of the Province in May, June and July. They are some 400 in number, the talks being given by 34 lecturers whose special subjects are given under each name. These subjects cover sanitation and hygiene, training of children, economy and home management, together with the detailed treatment by demonstration lectures of the domestic arts, cookery, sewing, and household methods. The organization seems to be most thorough, as we should expect from our Canadian neighbor. Moreover the report is "Printed by order of the Legislative Assembly of Ontario."

A Correction.

Through an oversight the thesis published in the October number of the *Journal* entitled *The Functions of the Trade-mark*, by Miss Anna Roberta Van Meter, was stated to have been submitted at the University of Illinois. The institution which should have been thus credited is the University of Chicago.

NEWS FROM INSTITUTIONS.

University Dissertations.

The following original studies in the fields related to Home Economics appear in doctors' dissertations for the degree of Doctor of Philosophy in the American universities last year. The list in full is printed in *Science*, August 20, 1909.

Yale University—Arthur Wayland Dox: "The Intracellular Enzymes of *Penicillium* and *Asporgillus*, with Especial Reference to those of *Penicillium Camemberti*," [Studies of Camembert cheese]; Warren Witherell Hilditch: "Studies on the Influence of Alcohol upon Metabolism;" Israel Simon Kleiner: "Studies in Intermediary Metabolism—the Physiological Action of some Pyrimidines;" John Franklin Lyman: "Experimental Studies on the Metabolism of the Purins in the Mammalian Organism;" Victor Caryl Myers: "The Chemistry and Physiology of the Pyrimidines, Thymine, Cytosine and Uracil;" Mary Davies Swartz: "Nutrition Investigations on the Carbohydrates of Lichens, Algae and related Substances."

Cornell University—Ludwig Reinhold Geissler: "The Measurement of Attention;" William Henry Pyle: "An Experimental Study of Expectation."

Columbia University—George Herbert Betts: "The Distribution and Functions of Mental Imagery;" Walter Hollis Eddy: "The Synthesis of some Proteid Salts;" Alfred Peirce Lothrop: "The Effects of Bone Ash in the Diet on the Gastro-intestinal Conditions of Dogs."

University of Chicago—Wales Harrison Packard: "On Resistance to Lack of Oxygen in Animals;" Harvey Andrew Peterson: "The Influence of Complexity and Dissimilarity in Memory."

Johns Hopkins University—Louis J. Rettger: "The Coagulation of Blood."

Harvard University—Herbert Joseph Spinden: "Maya Art;" William Dunlop Tait: "An Experimental Study of Memory in Relation to Psychophysical Attitudes."

University of Pennsylvania—Marion Mackenzie: "Phyto-phenology—The Relation of Climate to Plant Life;" Stevenson Smith: "Studies in Educability."

Clark University—John Franklin Bobbitt: "The Growth of Philippine Children;" Louise Ellison: "Consciousness in Relation to Learning."

George Washington University—Harry Wilson Houghton: "The Effect of Cold Storage on Chicken Meat;" George Whitfield Stiles: "The Possibility of Shellfish Contamination from Sewage-polluted Waters."

University of Chicago.

During the autumn quarter, Dr. S. P. Breckinridge of the Department of Household Administration delivered a series of five lectures on the Modern Household before the faculty and students of the department. In these lectures

she attempted to formulate and to discuss briefly the problems which seem to her of peculiar significance to the intelligent housekeeper at the present time. The sequence of thought was somewhat as follows:

In the recent past, women in the family have been set free from legal disabilities under which they formerly labored. Whereas married women prior to 1848-1875 in America and to 1873 in England were legally incapable, could not control property, transact business, earn wages which they could control, or exercise legal power over their children, they are now in many places legally capable in respect to all these things.

On the other hand, in the earlier time they were often industrially and economically competent because the home was an industrial unit. The removal of the industries from the home and the failure on the part of the women at the head of households to retain control over them has meant (1) that the function of the housekeeper has been reduced to the performance of the as yet unorganized tasks, and to spending, and (2) that modern industry has been built upon principles governing business in which the desire for a profit dictates instead of upon principles applicable to the home in which the desire for well-being dominates. Legal competence has, therefore, come hand in hand with industrial and domestic incompetence. The problem is, then, to apply the intelligence formerly necessary for the performance of the industrial processes within the home to the spending function and likewise to the control of the industrial processes wherever they are carried on.

The first means the acquisition of accurate information with reference to the business methods of the time, not so much that they may be imitated in the management of the home as that exploitation by means of them may be avoided. The second means a wider and wider application of what may be called the principle of compulsory standardization, and more and more complete utilization of the services of experts in the performance of duties connected with the application of social standards. In illustration of the former point reference was made to the manner in which the advertiser is making use of psychological principles to exploit the buyer through devices of advertising and display. As an example under the second point, attention was called to the extent to which housing conditions, the purity of food, the various stages of the educational process, the conditions of industrial workers and even the decency and efficiency of the home are in process of standardization, so that the engineer, architect, bacteriologist, chemist, educator, industrial supervisor, and probation officer are as experts aiding in doing away with unendurable conditions and in the establishment of those which are socially sound and advantageous.

Teachers College, The Educational Museum opened for the academic year 1909-10 on Monday, November 1, 1909.

University. The first special exhibit for the year was arranged with reference to the work of the newly-opened School of Household Arts. It consisted of a large part of the valuable collection of seventeenth, eighteenth, and nineteenth century samplers owned by George A. Plimpton,

Esq., of New York, representing the needlework of girls in various parts of America and Europe during a period of about two hundred years. This special exhibit closed on November 30.

West Virginia University. A department of Domestic Science has been established and is being organized under the direction of Miss Neva A. Scott, a graduate of the National Cooking School of Washington, D. C. Instruction is to be offered in cookery, dressmaking, millinery, raffia work, nature and treatment of textile fabrics, etc.

Manitoba Agricultural College. The board of directors have decided to extend further the usefulness of this institution by opening its doors to the young women of Western Canada.

The course in Household Science to be inaugurated will begin on May 3, 1910, and terminate about the end of August, and will cover the following subjects: Cooking, sewing, nursing, laundry work, English, chemistry, horticulture, home dairying and keeping of home accounts. Until a building can be provided which will be devoted solely to this work, the boy's residence, class rooms, laboratories, etc., will be used; while the top floors of the dairy and science building will be converted into kitchens, and laundry and dressmaking rooms. Miss A. B. Juniper, dean of the School of Household Science in Macdonald College, since its establishment, has been appointed professor of Household Science.

The demand for training in this branch of study has been a pressing one in Manitoba, and it is believed the board has acted wisely in making the necessary provision for it at their earliest possible opportunity.

King's College for Women, London. The Post-Graduates' Course in Home Science which was opened last year is proving its value in a manner encouraging to its original promoters.

The students have more than doubled in number. Of the fourteen present this year, one is an Oxford graduate, three are Cambridge graduates, four are graduates of Schools of Domestic Economy and the remainder are women of varied experience.

The students are all loyally enthusiastic in their interest in the work. With very few exceptions, they are looking forward to posts as lecturers, inspectors and heads of departments.

Albany Vocational School. A circular describing this vocational school, recently organized in Albany, has just been issued and may be obtained from the New York State Board of Education, Department of Trade Schools, Albany, N. Y.

This school takes pupils who have had the "fundamentals" in the first six grades and furnishes a course including the seventh and eighth grades in the elementary school and two years beyond this. This provides for book work and practical hand work. The first two years the studies are general in character, specific lines of work being developed in the last

two. The "home making" teacher is a graduate of Pratt Institute, and has had two years work at Wellesley College, and two years' experience as teacher in Domestic Science in a western college. The "sewing and household design" teacher has had work in special lines in the summer course of Columbia and New York universities.

The aim of the school is to give provision for the vocational needs of those likely to enter industrial pursuits. The work for girls is as follows:

FIRST YEAR.		Minutes per week
Sewing: hand and machine, simple garment making	.....	225
Plain cooking and general housekeeping	.....	450
Design	.....	225
Practical mathematics	.....	225
English literature and composition	.....	225
Geography	.....	225
Opening exercises, music, physiology and study	.....	225
		<hr/> 1,800
SECOND YEAR.		
Sewing: hand and machine, garment making, embroidery, textiles	.....	225
Cooking (plain, fancy, invalid), housekeeping	.....	450
Design	.....	225
Practical mathematics	.....	225
English literature and composition	.....	225
History and civics	.....	225
Opening exercises, music, hygiene and study	.....	225
		<hr/> 1,800
THIRD YEAR.		
Special work in millinery or dressmaking or Domestic Science	600	
Design	.....	300
Applied mathematics	.....	225
English literature and composition	.....	225
Practical physics relating to the home	.....	225
Industrial history	.....	150
Opening exercises and unassigned	.....	75
		<hr/> 1,800
FOURTH YEAR.		
Special work in millinery or dressmaking or Domestic Science	600	
Design	.....	300
Applied mathematics	.....	225
English literature and composition	.....	225
Chemistry relating to home and industry	.....	225
Economics and industrial conditions	.....	150
Opening exercises and unassigned	.....	75
		<hr/> 1,800

**Boston High
School of
Practical Arts.**

During the first year at this school, the course is the same for all pupils; six periods per week being given to sewing and four to cooking and housewifery. At the beginning of the second year a girl may elect Household Science, dressmaking or millinery as her special subject and devote to it 10 periods per week. She still has, however, a certain amount of work in the other two subjects and 20 periods per week of required subjects.

The course in Household Science aims to train girls in all that pertains to the art and science of practical housekeeping. To this end practice is given in the care of the house and in marketing, cooking, and planning meals for persons of different occupations as well as for families and for institutions.

The school has two kitchens, each equipped with twelve gas stoves of the common type, arranged in groups of four, kitchen tables, and a sink. An attempt has been made to have the conditions as nearly like those of the home kitchen as possible. Two girls use a stove together, thereby accommodating 24 students at a time. The work in the kitchen is practical cookery. Meats, vegetables, butter, eggs, etc., are bought, prices compared, and studies made for the purpose of learning to provide wholesome and economical dishes. More delicate food is also prepared. In the chemical laboratory the scientific part of the work is carried on. The two departments are closely correlated.

Every day about 150 girls cook, and the food is sold to the teachers and pupils at the lunch hour. In this way the money obtained pays for the materials used, these costing about \$60 weekly.

In connection with this department, a flat of six rooms has been rented near the school, and groups of girls are taken there for lessons in laundry work, cleaning, and general care of the house. Meals are planned and prepared by the girls working in groups of five or six and these meals are served to invited guests. The science department takes up the study of heating and ventilating the house, the plumbing and general sanitation, and the drawing department deals with the decorating and furnishing of different rooms.

**Boston Trade
School for Girls.**

In this school, which was made a public school last September, the Domestic Science work is on a plan very different from that at the Boston High School of Practical Arts.

The serving of a hot lunch to girls who are at work in various departments from 8.30 A. M. till 5 P. M. is the main feature. The preparation of the lunch is done by the pupils and they are given as much practice as possible in cooking and serving it and in cleaning up afterwards.

The kitchen has been enlarged and the work will be broadened in the near future. Those in charge of the school believe that girls who are fitting to enter the trades of millinery and dressmaking should receive sufficient instruction in cookery and housewifery to enable them to become competent homemakers.

NEWS FROM THE FIELD.

Illinois Domestic Science Con- ference.

The second annual meeting of the Domestic Science Section of the High School Conference was held at the Woman's Building of the University of Illinois, November 19, and was attended by teachers from all parts of the state.

Dean Davenport of the College of Agriculture of the university gave an address on The Educational Value of Domestic Science in the High School which was very helpful. Some of the thoughts brought out were as follows: Whatever the work of the grades, the high school is the place to get a broad view of some of the problems of society. Since primitive times there has been division of labor, yet in civilized society the study of the home should not be a study for women alone. The factory rather than the home is calling the girl, and this makes necessary an effort to make the keeping of the house a respectable business. The idea that we are not to presume that the girl of the high school is to be a housekeeper is false. We have reached the place where, if the teaching of Domestic Science is not successful, the law will require every girl to be taught how to keep house. Domestic Science in the high school brings about a rational view of life. It makes better students. It gives a deeper meaning to other subjects. The home has ceased to be the industrial and social center and the school must take account of this fact.

Miss Mary S. Snow, Supervisor of Household Arts, Chicago Public Schools, inspired the teachers by her discussion of the subject, Relating Domestic Science to Other Subjects and to Life. She pointed out that Domestic Science touches every subject and everybody. The time to teach practical sewing, in her opinion, is in the fourth, fifth and sixth grades. Very much practice work in cooking should be done in the seventh and eighth grades, then in the first year of the high school the student has something in mind to theorize about. She cooks again, but from a different point of view, i. e., to explain results, to gain facts. The science teacher should be very anxious to learn how to make practical applications. The Domestic Science teacher should be able to handle the sciences, and not say that bacteriology is too difficult to tackle. Surely these small organisms are not as difficult to manage as the high school girl and boy. We can not get along without the sciences—cannot teach cleanliness without bacteriology, cannot teach nutrition without physiology and chemistry, cannot teach the effect of heat and processes of cooking without chemistry and physics. Domestic Science is fundamentally chemistry—chemistry of digestion, of nutrition, of food. It includes bacteriology, biology, and physics. The course of study should include chemistry for three years and physics the last year. Physiology should be taught the first and fourth years. Making of dresses should be taught the first year when the individual life is intensive and vanity is greatest. In the second and third years the course should be more adapted to family life—the care of the house, sewing for the household and work in

dietaries. In the fourth year the needs of the orphaned and the sick as well as those of her own family—the civic life, the great study of economics—should be taught. The interests of the girl should be kept expanding and broadening from her freshman to her senior year.

Brief reports of the Denver meeting of the American Home Economics Association and of the Western Manual Training and Drawing Association which met in St. Louis last May were given.

The Syllabus of Domestic Science for the High Schools of Illinois which has been used by the teachers during the past year was the subject of discussion at the afternoon session, particularly along the following lines suggested by the executive committee: First, that it be made clear in the introduction of the revised syllabus that more than a unit's work in each of the three subjects, food, clothing, and the home is planned in order for the teacher to have opportunity for selection and adjustment to conditions; second, that the topics considered essential in the work of one unit be starred, it being understood that choice may be made from the remaining topics; third, that the heading of the columns be changed from theory and practice to recitation and laboratory; fourth, that the name be changed to Syllabus of Domestic Science and Art for the High Schools of Illinois; and fifth, that a list of reference books and magazines be added to each of the three subjects.

After thorough discussion, a revision was voted, and the work was put into the hands of the new executive committee. The following additions were suggested—more hygiene, study of materials used in home furnishing, the decorative stitches, making of lace, a little millinery, and more about the cost of living and marketing. It was also suggested that the sociological and economic side of the home should be made more prominent.

The report of the executive committee showed that 58 public high schools of Illinois are teaching Domestic Science, a gain of 16 over last year; that 43 of these schools are teaching food, 41 clothing and 25 the home; and that more than one half of the counties of Illinois are teaching Domestic Science or Household Arts to some extent.

The teaching of these subjects in the high schools of Illinois is encouraged and recognized by the university in granting one unit of entrance credit for Domestic Science. The following definition of one unit's work recommended by the committee was accepted by the section: (a) An equivalent of 180 hours of prepared work with at least two recitation periods a week in foods; (b) an equivalent of 180 hours of prepared work with at least one recitation period a week in clothing, or (c) an equivalent of 180 hours of prepared work with at least two recitation periods a week on the home. Two periods of laboratory work are considered equivalent to one period of prepared work. Two half units taken from (a) and (b), (a) and (c), or (b) and (c) will also be accepted as a unit's work. The syllabus is recommended as a basis for a unit of entrance credit. The work is to be done by trained teachers with individual equipment, as determined by inspection.

**Home Economics
Association of
Iowa.**

This association was organized at the time of the meeting of the Iowa State Teacher's Association in Des Moines, November 4-6, and is affiliated with the American Association of Home Economics. Notice of the organization meeting had been sent to all of the teachers of Home Economics in the state, and also to a number of housekeepers who were known to be especially interested in the subject. About thirty responded to the invitation.

Before the business meeting, an informal program was given, Mrs. Isaac Hillis and Mrs. J. J. Hamilton, club women of Des Moines, discussing the question, How Mothers may Co-operate with Teachers of Home Economics to make the Work of the Schools Most Effective when Applied in the Homes, Mrs. Alice D. Feuling of the Iowa State College of Agriculture and Mechanic Arts speaking on An Ideal Public School Course in Home Economics, and Miss Mary L. Townsend of the Iowa State Teachers College, discussing the subject of Means and Methods to be Employed in Interesting People in Home Economics. At the business meeting, a constitution was adopted and the following officers elected for the year: President, Mrs. Alice D. Feuling; vice-president, Miss Beulah Long, Drake University; secretary-treasurer, Miss Mabel Campbell, Iowa State College of Agriculture and Mechanics Arts; additional members of the executive committee, Mrs. Eleanor Holloway, Des Moines Public Schools and Miss Cornelia P. Moran, Waterloo Public Schools; and councilor-at-large, Miss Mary L. Townsend.

The annual meeting will be held at the time and place of the meeting of the State Teacher's Association, but it is the plan now to have at least one other meeting during the year. It is hoped that the new organization may be the means of arousing a much deeper interest in the introduction of Home Economics into the public schools than has ever been felt in the state.

**Domestic Science
and Arts in Ohio.**

A meeting of the Domestic Science and Arts Section of the Manual Training and Arts Association of Ohio, was held in the Toledo High School, November 12, with about thirty teachers from Columbus, Dayton, Cleveland and Toledo in attendance. After welcoming the visitors, the chairman, Miss Isla M. Campbell, Assistant Director of Manual Training, Toledo, suggested the possibility of forming a permanent organization in order to know what was being done in different parts of the state. Pending consideration of this question Miss Carlotta C. Greer of the Cleveland Technical High School spoke on the subject of The Best Educated Girl, and Miss Rachel H. Colwell, of Lake Erie College, Painesville, gave a talk on The Use of the 100-Calorie Portion in Estimating the Total Food Requirement for the Day.

Miss McKinley then told a little of the work that is being done in Dayton. She said that they were particularly fortunate in having the whole session of the morning and afternoon for each class. She suggested the following pertinent questions: Whether the best results are to be obtained from small groups or individual work? How much theory

should there be in the grades and how much in the high school? How long should be the course in the high school? Should there be one course for students who stop at the end of the grades and one for those who expect to go on through the high school? Should one try to give more than one recipe in a lesson? Should all the pupils be doing the same one? Is it wise to put on the slip that the students take home more recipes than those actually done in the class?

Miss Campbell emphasized the necessity of correlation of the work with other departments. She said that the community life was lost when the pupil does each thing for herself. In the Toledo Manual Training High Schools, the boys, in carpenter work, made a bed and the girls the bed-clothes. She also brought out the point of the importance of the relation of the pupil's work to his outside life.

Much interest was aroused by these papers and it was felt that the time was too short for their proper discussion. A permanent organization of a Domestic Art and Science Section was formed with Miss Greer as chairman, and Miss Thompson, of the Dayton Schools, as secretary and treasurer. The chair was given power to appoint an executive committee, which is to prepare the programs and attend to the business of the organization. It was voted to meet next fall at Dayton, as the main organization—the Manual Training and Arts Association of Ohio—meets there at that time. It was also decided that as many of the section as possible should plan to meet in Cleveland, February 11, at the time of the meeting of the Northeastern Ohio Teachers' Association. The desire was expressed to judge as to what was being done in the work in the state by the exhibits to be shown at that meeting.

Domestic Science Miss Mamie E. Gearing of Houston, Texas, writes:
Work in Texas. "We are doing so much throughout the state in our line

of work it is hard to tell which is the most important. Domestic Science and Arts have been placed in many of the grade schools throughout Texas during the last few years. This past year the state has established the work in all of the state normals, and we have strong hopes of seeing it in the University before many years.

"In Houston, the work has grown in the past three years from a two years' cooking course in the high school, for which no credit was given, to ten fully equipped centers in the white grammar schools, and two in the negro schools. Every fourth and fifth grade in the city has sewing taught, and the sixth and seventh grades cooking, (we have no eighth grades.) There is a four years' diploma course in Domestic Science and Arts, in the high school. The work is compulsory in the grade schools, and in the first year of the high school.

Our County Medical Association has recently organized a milk commission for the purpose of investigating the local milk supply, and having stricter and better enforced municipal laws in regard to it. Our department has been asked to cooperate in this movement and has been given representation on the board."

BOOKS AND LITERATURE.

Misery and Its Causes. E. T. Devine. New York: The Macmillan Company, pp. 274. \$1.25.

This volume is the fourth in the American Social Progress Series which presents the substance of lectures delivered annually before the New York School of Philanthropy. The previous volumes have been: *The New Basis of Civilization*, by Professor S. N. Patten of the University of Pennsylvania; *Standards of Public Morality*, by Arthur Twining Hadley, president of Yale University; and *Legislation and Administration for Social Welfare*, by Professor Jeremiah W. Jenks of Cornell University. Dr. Devine's volume is a discussion of remedial poverty, and his conclusions are based on his experiences as Secretary of the Charity Organization Society of New York. These generalizations are supported by a wealth of facts which are presented in detail. The chapters are: *Poverty and Maladjustment*; *Out of Health*; *Out of Work*; *Out of Friends*; *the Adverse Conditions in Dependent Families*; and *The Justice and Prosperity of the Future*. The concluding chapter is a striking presentation of a practical Utopia for which all may work and in which the Home Economics student and teacher may feel he has a hand. The characteristics of this better time will be the provision for each individual of a sound, physical heredity; a protected childhood; a prolonged working period of both men and women; freedom from preventable disease; freedom from professional crime; a general system of insurance against contingencies of death, old age, accident, sickness, and unemployment; a system of elementary education adapted to the present day needs; a liberal relief system and a standard of living high enough to insure full nourishment, reasonable recreation, shelter and other elementary necessities. It is in such a program that Home Economics must largely express itself. Students of Home Economics will also find the chapter which discusses the adverse conditions which most commonly make families dependent, useful in making clear the exact nature of the problems with which they have to deal.—B. R. Andrews.

The Spirit of Youth and the City Streets. Jane Addams. New York: The Macmillan Company, pp. 162. \$1.25.

In this work Miss Addams presents some of her papers dealing with city conditions and the remedial measures necessary to secure better living, especially for the young people.

The chapters are: *Youth in the City*; *The Wrecked Foundations of Domesticity* (emphasizing the changes which have come in family relations in the city); *The Quest of Adventure*; *The House of Dreams* (a study of youth in relation to the theater); *Youth in Industry*; *The Thrift for Righteousness* (a statement of the need of readjustment in religious enterprises).

The book as a whole is an interpretation, an explanation of the perversions and unhappiness brought into the life of youth by the reaction of world-old human nature upon a new environment, the modern man-made industrial and commercial center. It will contribute richly toward

an intelligent point of view among Home Economics workers in our cities.—B. R. A.

The Fireless Cook Book. Margaret J. Mitchell. New York: Doubleday, Page & Co., 1909, pp. xii + 315, figs. 18. \$1.25.

The fireless cooker and the concrete house which may be swept with a hose are destined to bring a great change in the established routine of living. This volume is a forcible exploitation of the merits of the fireless cooker. The economy of fuel, the reduction of heat in the kitchen, the saving in wear and tear on utensils, and the bearing of fireless cookery on the servant problem are all well brought forward.

As a cook-book it is not especially valuable, the recipes being mainly adaptations of the old stand-bys to the new appliance. More emphasis might have been laid upon the use of ordinary recipes with a reduced proportion of water since the fireless case affords no opportunities for evaporation.

Though many processes in cooking may be carried on in the fireless cooker and insulated oven it is still an open question whether its use in some cases is true economy of energy. The advantage of this plan of continuing heat for the cooking of tough meats, however, is rarely disputed, certainly not by any one who has tried it fairly.

Miss Mitchell gives explicit directions for the manufacture of cookers suited to one's own needs. One chapter is devoted to the use of the insulated oven, the later form of the fireless cooker, where stone slabs, iron plates or fire brick are heated and placed in the case under and over the receptacles containing the food. Thus sufficient heat is secured to brown meats and even to bake bread, pies and cakes.

The teacher of Domestic Science will find in the twenty page appendix suggestive material for experiments with utensils aside from their relation to the fireless cooker.

The faults in the book lie mainly in little inaccuracies in the recipes. An excess of soda is always to be deplored and while a little is desirable one teaspoonful to one cup of dry beans is excessive, especially when this is used not for a brief par-boiling, but is left through the eight hours in the fireless. Moreover in the table of proportions the amount of soda given for use with sour milk, molasses, etc., is more than necessary.—A. B.

Antique Chinese Rugs. New York. The Tiffany Studios, 1908, pp. 96, pls. 33.

The historic periods in Chinese art, the materials used, the methods of weaving Chinese rugs, colors employed, designs found in such rugs, and the classification of rugs according to design, and according to color, are the principal topics discussed. Many rugs including those shown in the plates are described. The volume as a whole constitutes an important and valuable compendium of information on this subject. The illustrative material is taken from the Tiffany Studios' collection of antique Chinese rugs.

In general, Chinese rugs are made of wool or silk though metal threads are sometimes introduced. Chinese rug knots are tied exactly as the Persian or Sinneh knots, differing in appearance simply because of the looser web.

"At whatever actual time the Chinese rugs were made which now exist in collections and museums, the designs used by their makers may be

readily classed as belonging to one or another of five great styles that have made Chinese art what it is. . . .

"The Chinese observe the ordinary methods employed all through the Orient in the weaving of pile carpets, the difference in the finished product being due to slight technical variations that serve as earmarks for identifications. These may be noted in the warp and woof threads, and in the way the knots, the ends of which make the pile, are tied. Even without actual historical records of how and when Chinese fabrics were made, it is quite possible to divide existing specimens in such a way as to determine the relation of one fabric to another; the changes from domestic to factory weaving and preparation of materials being quite apparent to the analyst.

"The Chinese rugs which are available for examination and study today, about which expert students have a right to speculate, and in regard to which trained opinion is of great value, are made with a pile of either fine or coarse wool, hair, or silk, seldom if ever of either cotton or jute. Sometimes the wool is so coarse that it has the appearance of jute, and rugs are often classified as jute that are in reality of coarse hair or wool. . . .

"Chinese rugs en masse have a vastly different appearance from a corresponding number of Persian, Indian or Turkish fabrics. . . .

"The colors employed by the Chinese differ from those used by Persian rug weavers, in that the Chinese palette is the smaller. Where the Persians would introduce a dozen tones, the Chinese content themselves with four or five. We find in rugs of one class two shades of yellow, two shades of blue and cream color; in another two shades of blue, cream color and apricot red; in another two shades of yellow, two shades of cream and apricot; and in another two shades of blue, cream, brown and two shades of yellow. A Persian rug classing with these would have yellow, two shades of blue, cream, several shades of green, fire color, turquoise blue and many shades of red. In Chinese rugs, however important, one fails to find many colors. The rugs of Chinese-Turkestan and of the Samarcand district lean toward Indian and Persian methods of introducing colors, but strictly Chinese rugs only show four or five tones."

The Educational Value of Photography in Public Schools, Fred D. Maisch. *Photo Times*, 41 (1909), No. 10, pp. 378-382.

The advantage of using photographs in many lines of college and university study has been appreciated for some time. This article points out their value for illustrative purposes in the common schools. Special attention is called to the work of the Philadelphia Commercial Museum in sending out to the schools of Pennsylvania, at state expense, photographs of its numerous collections of commercial raw and manufactured materials. Fully 200,000 of these photographs are now being used in the schools of the state. The facts of geography, commerce, manufactures, and the national life of various countries can be brought home to the understanding and appreciation of children through actual photographs as they can not by any other form of representation. "With such photographs before them our school children will grow up with a better understanding of the world at large, with a firmer and wider grasp of events, and be better fitted to enter the business world which, in some form or other, is the ultimate goal of everyone."

Domestic Art Review, New York. The November issue of the *Domestic Art Review*, published by a student organization of Teachers College, contains articles on woman's dress from the standpoint of suitability, economy, art and hygiene.

A comprehensive view of the scope of the work of the new School of Household Arts is given in the article written by Dr. Andrews, secretary of the school.

Accounts of the work being done in the Ohio State University, in the Manhattan Trade School, in the Kalamazoo Manual Training School and in the North Bennet Street Industrial School in Boston are interesting and suggestive to Domestic Art teachers.

The annual competition for the Hart Schaffner and Marx essay prize in Economics for 1909 has been awarded to Frank H. Streightoff, who presented a paper on The Standard of Living or Budgets of American Workingmen's Families.

Mrs. Kirk's Handy Expense Card for Housekeepers. Mrs. Alice Gitchell Kirk. Cleveland, Ohio. Price 50c.

This is a system for keeping household expenses on cards. It includes fifty weekly cards, twelve monthly cards, one yearly card, and a card of directions. It itemizes expenses with the following classification: Groceries, Meat and Provisions, Milk and Ice, Fuel and Light, Service, Utensils, Laundry, Miscellaneous, Personal,—B. R. A.

The Chautauqua Genealogy. A continuous personal history and family record. The Educational Specialty Co., Detroit, Mich.

This is a family record book which is bound in a convenient form. It would be of interest and value to any person desiring to work out the record of his ancestry. The book includes radial charts and family charts, systematically arranged for showing family relationship. There are also blank pages for individual biographies, clippings, sketches, etc., and an index to be filled in as the entries proceed. With the record book goes a handbook of directions.—B. R. A.

LIST OF MEMBERS AMERICAN HOME ECONOMICS ASSOCIATION, JANUARY 1, 1910.

NOTE:—In the list of members the professional position of each member is indicated following each name. The following abbreviations used in indicating positions may need explanation:

Adm.—Administration.
Agr.—Agricultural.
Coll.—College.
Com.—Committee.
D. A.—Domestic Art.
D. S.—Domestic Science.
Ed.—Education.
El. Sch.—Elementary Schools.
H.—Household.
H. Sch.—High School.
Ind.—Industrial.
Inst.—Institution.

Lab.—Laboratory.
Lib.—Librarian.
Lect.—Lecture.
Man. Tr.—Manual Training.
Nor. Sch.—Normal School.
Pub. Sch.—Public School.
Publ.—Publisher.
San.—Sanitary.
Secd.—Secondary.
Supv.—Supervisor.
T.—Teacher or Instructor.
Tech.—Technology.

This list was prepared from the mailing list of the Journal and therefore includes libraries, institutions, etc. For the same reason it was found impracticable to make the list strictly alphabetical, but is believed all names will be found under the appropriate initial letter. Corrections will be heartily appreciated.

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SCHOOL FEEDING IN EUROPE.

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It has been said on creditable authority¹ that from 60,000 to 70,000 children in New York City alone often arrive at school hungry and unfitted to do well the work required, and by another authority that in the same city 175,000 fail in their studies because they do not get enough of the right kind of food. The pitiful tragedy of attempting to educate children who are continuously hungry is so obvious as to need no discussion.

As opposed to this picture, which is painted for us in lurid colors, we are told that "they do things better in Europe;" that there, in most of the large cities, (for example, in Paris), at the noon period, the children file in regular lines by small ticket offices and to each is given a ticket. No one knows whether anyone else pays or what is paid for the ticket. Teachers and pupils alike secure these tickets, and sit down together to a modest, clean, well served, inexpensive lunch. We are informed that in consequence, the children progress better through the schools, and that there is none of the starvation which is pointed to on this side of the water. It is said further that this feeding of school children has no undesirable effects upon the parents,—that it does not make them feel less responsible for their children.

We do not know to what extent these various statements are true. The first thing to do is to get at the truth, the real facts. Before undertaking school feeding on an extensive scale here in America, for example, we ought to know what the results of experience are under the various conditions which obtain in the different cities and countries of Europe where it has been long carried out. We need to know how the children are fed, what they are fed, whether it is done by philanthropic or state moneys. We need to know whether it is carried out by the school or other authorities. We need

¹ROBERT HUNTER.

to know the effect of such feeding upon the family. We need to know what other attempts have been made to solve this difficulty aside from feeding children in school. The malnutrition of school children is obviously a part of the larger problem of poverty. We ought to know to what extent this fraction of the problem can be isolated and treated by the means proposed. This, in general, is the point of view from which our study has been made. The present article aims merely to give some idea of the extent of the movement in Europe and something of the character of its development.

When, in 1905, England was facing the problem of national deterioration, an aroused public demanded that the government should undertake to provide food for all school children as an immediate remedial measure. In order to find out to what extent other governments had assumed a similar responsibility, the English Board of Education made an inquiry concerning the methods adopted by great Continental and American cities for dealing with underfed children. The inquiry covered thirty-eight cities in thirteen countries. Of these, with the exception of the three American cities, every one reported organizations of some kind for school feeding. Moreover, with a single exception these organizations were either supported entirely or in part by municipal funds.

Subsequent investigations showed that these cities were not exceptions. The movement is national in scope in many of the great countries in Europe and many of the establishments are old. As far back as 1790, the city of Munich supported soup kitchens and hungry children were sent to them from the schools. About the middle of the 19th century semi-official societies were formed in a number of countries for the purpose of encouraging school attendance. One of the most usual means adopted was the provision of meals free or at cost to the school children, and a great many organizations were started at this time. The small town of Freising in Germany has had school breakfasts for over fifty years.

Perhaps the most striking single indication of the seriousness with which the matter is being attacked is that the central governments of Great Britain, Holland and Switzerland have passed laws with special reference to the provision of meals for school children. In Germany and Denmark, teachers, school doctors and social reformers are joining in a campaign for national legislation.

In France while there is no national law with direct reference to school feeding there is a law compelling the establishment in all towns

of school funds (*Caisses d'Écoles*) which are designed to support what might be termed the extra-academic activities of the school, for example, vacation colonies, school excursions, school baths, and school restaurants. The school restaurants (*Cantines Scolaires*) are now found throughout France. As the French cantines are generally accepted as the models for school lunches we will begin our survey of the European system with them.

France.—In 1871 the city of Angers in western France started “people’s kitchens” in the public schools. From their inception up to the present time these kitchens have served mid-day meals to school children from November through May each year. The price of each meal is two cents in our money for all those who are able to pay, and it is given free to those who are unable to do so. The movement in Angers may be considered the true beginning of the work that now exists in France although there has been some provision for feeding school children ever since 1849 when the “*Caisses d'Écoles*” (school funds) were started in Paris.

The movement spread rapidly until at the present time there are school restaurants of one type or another in almost every town and city in the republic. As we have said, there is no national law making their establishment compulsory, but the movement has simply developed until it has now come to be regarded as an integral part of educational work and providing it is almost as much a matter of course as erecting school buildings or engaging school teachers.

In the smaller towns the work is often coöperative, the teacher, the parents, and the children all contributing something. The teacher gives his services, the children bring whatever food they can, the necessary additions are supplied from the public fund and the mid-day meal is prepared in which all share.

Such coöperative work is possible only in the smaller towns. In the larger places regular school restaurants are supported largely or entirely from municipal funds. These supply each day a meal of soup, meat, vegetables, and sometimes a little dessert at cost prices. This varies from two to three cents per meal and provision is always made by which the children who are able to do so, pay, while those who cannot are fed at public expense.

Paris is the only great city of the world which makes complete and adequate provision for the proper nourishment of all of its school children. The movement started in 1879. In 1881 it was made general throughout the city and a subsidy of \$9,600 was voted to

help defray the expenses. Since that time the subsidy has been greatly increased until now the city pays the entire cost of the school restaurant. The budget for 1909 included a subsidy of \$210,000 for the support of school meals. This does not include the daily fee of twenty-five cents which is given to each teacher who supervises the children during the meal hour from 11:30 to 12:30 every noon.

Each district administers its school restaurants independently as experience has proved that in this way the particular needs of each district can best be met. All of the children, rich and poor, are encouraged to eat together and there is no distinction made between those who pay and those who do not. A child who wishes to may bring his own meal with him and eat it with the other children who receive the lunch which is provided.

To quote from the report of the Commissioner sent by the London *Lancet* to investigate this work,

From the very first the greatest care has been taken not to allow any loss of dignity to arise from the free feeding. The fundamental principle of the whole management is the absolute innocence of the children. Their parents may be at fault. If so, that is only the greater reason to shelter the children and to try to preserve in them that sense of self respect which may so easily be wrecked by their parents' bad conduct.

To avoid any possibility of the children themselves knowing who pay and who do not the simple device is used of a small box office through which each child goes to purchase his ticket. If he claims that he cannot pay the ticket is still given, but his name and address are taken and inquiries are made. Each case is carefully investigated. Where the parents are found able to pay they are compelled to do so, but where they are not, tickets are given to the child for as long a time as may be necessary. Various methods are used to determine whether or not the parents can pay. Sometimes the inquiry is made by the school principal, in other instances the parents request that the meals be provided and the case is investigated by the mayor of the district. If he gives his approval permission to receive free tickets is given at once. Otherwise a committee is authorized to investigate before decision.

The presence of the teachers at the same tables with the children is an important feature of the work. It is reported that fully 90 per cent of the teachers use the cantines more or less regularly, although there is no compulsion in the matter. They do it on account of the cheapness and wholesome character of the meal. Each one goes

through the little box office and secures his ticket in exactly the same manner as the most ragged urchin. Their presence at the tables results in practice in the most efficient sort of teaching in table manners.

During the year 1908 Paris supported 353 school restaurants. These supplied meals to the pupils of 588 schools. The children who received the meals numbered 38,531. This is an average of 190 children to each school restaurant and of 66 children from each school. The entire number of meals provided amounted to nearly eight million, or a little over two hundred meals for each child. This does not mean that each child was fed for two hundred days for in some of the districts light meals are given in the morning and afternoon as well as at noon.

The meals vary greatly in cost in different sections of the city. In the ninth arrondissement the average net cost was just two cents per meal, while in the third it was slightly over six cents. The average cost was just under four cents, to be exact 3.8 cents. The price paid by the pupils who purchased their meals averaged three cents per meal. This, indeed, has come to be in Paris the standard price. In thirteen of the twenty districts it is the price which is regularly charged. In two districts the meal tickets cost two cents only, and in only one district does it rise as high in price as four cents.

Germany.—We have already noted that school feeding had its beginning in Munich in 1790. At the present time it may fairly be said that the movement is national in scope, although there is as yet no State law regarding it. An investigation in 1909 showed that out of the 525 cities in Germany having more than ten thousand inhabitants 239 had some provision for meals at school. That is to say, there is school feeding in nearly one-half of the German cities. The reports from 189 cities showed that 43 had organizations supported entirely from public funds; in 68 others work was carried on by private societies subsidized by the city; in the remaining 78 cases the work was carried on by private organizations, although in nearly every case the school authorities coöperated in a substantial way by furnishing coal, gas, the use of school premises, and clerical assistance. In these 189 cities there are over 110,000 children receiving school meals. These constitute about 6.5 per cent of the entire school population in these cities.

From these data we may summarize the German situation as follows:

There is school feeding in about half of the German cities. In more

than a third of them work is carried on by private organizations co-operating with the school authorities. In another third of the cases the work is done by private organizations receiving public subsidies. In the remaining cities—somewhat less than a third—the work is done exclusively through municipal effort. Between 6 and 7 per cent of all of the children in the schools receive meals.

We have seen that in France the meal supplied is usually the mid-day lunch. In Germany the practice is to give breakfast at school instead. The work at Stuttgart may be regarded as typical of the better sort of organization. Here a breakfast of warm milk and a roll is served all the year round, at 7 a.m. in summer time and at 8 or 8:30 in the winter. In each district there is one school with a kitchen and dining hall and this central kitchen supplies all of the schools of that district.

Parents who wish their children to receive the meals fill out application blanks stating among other things whether or not they wish to pay. Cases where free meals are requested are carefully investigated and if it is found that the parents are in genuine need their requests are granted. Coupons entitling the children to receive meals are issued in small booklets, six coupons costing a little less than eight cents. The coupons which are paid for have certain lines on them which are omitted on the free coupons. These minute differences are kept a secret from the children who are unable to tell the difference between the two kinds of coupons. The kitchens are regularly inspected and are kept in sanitary condition.

At the present time there is a great awakening of interest in the whole problem of school feeding in Germany and a great amount of space in current educational publications is being devoted to these problems. Germany, moreover, is leading all other nations in scientific studies of school dietetics and trustworthy collection of data showing the results of school feeding.

England.—The movement for school feeding in England became a national issue at the time of the Boer war when the startling fact was published that only two out of every five men who wished to be soldiers were found to be physically fit for military service. Investigations carried on by two national commissions, the Royal Commission on Physical Training, and the Committee on National Deterioration, showed a very wide spread condition of malnutrition. It was averred that this was one cause of the alarming degree of military unfitness. Moreover, it was a cause that might be directly attacked and a cam-

paign was begun by social and political reformers that resulted in the passage by Parliament of the Provision of Meals Act in 1906.

However, this was not the beginning of school feeding in England. It was simply its crystallization as a national issue. The need for some provision for the feeding of children at school had long been felt. The investigation by a government committee showed that in 1905 there were 355 English organizations providing for school feeding in 146 cities and towns. But this voluntary service was found inadequate for many reasons. In the first place, the funds dependent upon charitable impulse were insufficient. They were often exhausted during the earlier winter months. Moreover, they were often inadequate to feed all of the necessitous children even during this short period. Then again the voluntary agencies had no authority to make the necessary investigations as to the ability of children to pay. Again it was generally agreed to be undesirable that the meals should be regarded as charitable relief.

A circular addressed by the English board of education to the local educational authorities giving them information and instructions concerning the Provision of Meals Act makes the following significant statement concerning the character and object of the law:

The Act, which is purely permissive and imposes no duty where the local educational authorities think it necessary to bring it into operation, is primarily of an educational character. Its object is to ensure that children attending public elementary schools shall, so far as possible, be no longer prevented by an insufficiency of suitable food from profiting by the education offered in our schools, and it aims at securing that for this purpose suitable meals shall be available just as much for those whose parents are in a position to pay as for those to whom food must be given free of cost.

The provisions of the act were generally adopted throughout England and Wales. In the spring of 1909 it was in operation in 134 districts out of a possible 327, and the number has materially increased since that time. The work has been broadened and has become more generally educational and more closely coördinated with medical inspection.

The best practice in England, as in France, sanctions the giving of a lunch in the middle of the day rather than a breakfast in the morning.

The administration of the school meals is generally given over to Children's Care Committees which are sub-committees of the educational authorities. The Care Committees are composed of school inspectors, teachers, social workers, nurses, etc.

In May 1909 the London County Council established Children's Care Committees in connection with each one of the thousand public elementary schools in London, making a total of five thousand persons serving on these committees in that one city. A cabled press report from London in December 1909 showed that the work is growing by leaps and bounds:

The London County Council found itself compelled yesterday to approve an extra expenditure of \$125,000 for providing free two cent and three cent meals to necessitous school children whose parents are unable to feed them. This supplementary vote will bring the money expended for this purpose by the end of the financial year 1909-10, March 31, up to over \$311,000 instead of \$150,000 which it was estimated at the beginning of the year would be sufficient.

The increase in the number of children needing this assistance has been marked. Five years ago some 5,000 were in this position, four years ago 6,000, a year ago 35,000 and this year 47,000. The number of free meals supplied in 1908-9 was over 4,500,000 and this year it will be over 7,700,000.

All parents whose children are fed by the County Council are informed by letter that the cost of the meals is charged against them and collected by law if they are found in a position to pay, but only some half dozen such prosecutions have been found necessary.

The smaller towns have a simpler problem than London and many of them have worked out very efficient organizations. This is notably the case in Bradford, Manchester, and Bristol. In 1906 the city of Bradford appropriated \$250 with which to carry on an experiment in school feeding. Forty children were chosen from the poorest class and weighed three times during five weeks. Then these same children were given breakfast and dinner from April 17 to July 24, 1907, holidays excepted, and weighed regularly during this time. During the same period forty "control" children of the same class were weighed and not fed and the results compared, or perhaps contrasted. It was found:—

(1) That the "control" children dependent on home meals gained on the average one ounce a week—a yearly gain of three pounds and four ounces.

(2) Children who were fed gained six ounces a week—a yearly gain of nineteen pounds and a half.

(3) During a holiday of ten days the children who had been fed dropped a pound apiece in weight.

(4) During this same holiday the control children freed from the strain of school work actually gained on the average one-half a pound apiece.

At the conclusion of this experiment another still more extensive one was carried on and since then school feeding on an extensive scale has been regularly instituted. During 1909 an average of 747 children were fed free daily while the total number of children dealt with came to something over 5,500. The school population of Bradford is about 47,000. Of these only about 200 paid for their meals, either wholly or in part. It is planned to extend this service so that all of the children who are able to pay may be accommodated.

The food is prepared in a large central kitchen and is placed in great heat retaining vessels and carried by motor cars to the twenty school dining rooms in the different districts. The kitchen is fitted with the most modern equipment. There are large steam jacketed boilers with a capacity of 100 gallons each, large porcelain baths for washing vegetables, a machine for cutting vegetables, tools for paring and coring apples, and thousands of soup plates, dinner plates, forks and spoons. Finally there are aprons and sleeves for the waitresses and teachers. These are made in the sewing classes by the children who also mend them when necessary.

The original cost for the equipment for supplying three thousand meals a day was \$3,000. Last spring it was so enlarged, at an additional cost of \$17,000, that ten thousand meals could be prepared. This included the installation of new bakers' ovens in which the city will bake its own bread. These are heated by steam from the same boiler house that provides heat for one of the schools and warm water for the public baths. This arrangement will effect a great economy in running expenses.

The dining halls are so arranged that the entire effect shall be educative. They are painted and furnished in light colors, the tables are covered with white table cloths, and plants or flowers are provided. They accommodate about 125 children each. Teachers who volunteer for the work but are paid a special fee for their services supervise the meals in all of the halls. There is one such teacher for about fifty children. Waitresses who serve the children are appointed from among the older children; sometimes they are girls from the secondary schools in the neighborhood.

One account of the work in the Bradford schools closes with the following significant statement:

The doctrine that child feeding would undermine parental responsibility has received a rude shock as scores of letters in our possession show that when circumstances improve parents are the first to report this to the committee, are often most

grateful for what has been done for them, and are anxious to make way for the children of those less fortunate than themselves.

Holland.—The work of school feeding in Holland before 1892 was carried on by voluntary societies. At that time when the municipalities began to give their support, there were no fewer than fifty-three communities supplying meals. The law of 1900 enforces compulsory education in Holland and a section authorizes municipalities to provide food and clothing for all needy school children whether in public or private schools. The object was to ensure school attendance. In the words of the royal decree of 1907 meals were to be given to children who are unable because of the lack of food and clothes to go regularly to school, or to those who probably would not continue to attend school regularly unless food and clothes are provided."

The cost per meal is restricted to about one and a half cents. The organization is about the same as in the other countries mentioned. Amsterdam serves lunch and sometimes breakfast during the school year. About four thousand children are fed in the winter time.

Refezione Scolastica in Italy.—San Remo was the first Italian city to have purely municipal provision for school feeding. This was started in 1896. There are no less than fifty towns in Italy which provide for school feeding. In more than half of the cases, the work is entirely municipal and in others it is carried on by private organizations which receive municipal subsidies. In all the work is regarded as distinctly educational and not as a charity.

Dr. Tonsig of Padua was the first person to investigate the actual food value of the meals which were served. The estimates he made then in regard to the correct dietary standards for school children marked the beginning of an important kind of work that has since been taken up by school doctors in all countries.

In Italy the school meals are attended by a larger percentage of children than in any other country. In some towns the percentage is as high as seventy-eight. Rome reports that fifty per cent of the children receive the meals and that ninety-five of these pay for them.

Switzerland.—So far back as 1894 an investigation in Switzerland showed that from thirty to forty thousand school children were being supplied with meals. These children were in eleven thousand schools, or about 28 per cent of all the schools. They constituted between 7 and 8 per cent of the entire number of school children.

In 1903 a federal law was passed which included a section providing for "distribution of food and clothing to poor school children." In

1906 permission was given to the cities to use state funds to help supply school meals. The report of a recent investigation reaches the conclusion that there are about 50,000 who should be fed, or about 10 per cent of the entire school population. The meal is generally the mid-day lunch.

Other countries.—Nearly if not quite all of the other European countries have taken some steps in the school feeding movement. Systems more or less highly developed are found in Austria, Belgium, Denmark, Finland, Norway and Sweden, and there are beginnings also in Spain and Russia.

Trend of Development.—There are certain general conclusions, both as to present scope and developing tendencies, which force themselves upon the attention of the student of the school feeding movement in Europe. In the first place the feeding of school children exists in practically all European countries and in many, if not most of them, it is national in scope. It is an old movement and in many places a thoroughly tried one. Its first beginnings date back more than a century, while during the past two decades its development has been increasingly rapid and consistent. So far as can be discovered there is no case of importance on record where it has been tried as an experiment and subsequently abandoned as impracticable or a failure. That it has commended itself both to the public and to the authorities seems conclusively demonstrated by its rapid increase and unbroken spread.

The provisions for its support are becoming more and more general in scope and less and less dependence is being placed upon purely local initiative. As legislative enactments are being made there is an increasingly strong sentiment toward making them mandatory in character, and as a corollary to this an increasingly lessened demand that such laws be purely permissive.

SCHOOL LUNCHES.¹

IRA S. WILE, M.D.

The school lunch problem is not new, but has arisen whenever a state has regarded the children as its wards. In ancient Sparta, there was a most successful school lunch system at which the attendance was compulsory, and the food most trying, the better to develop Spartan character.

The school lunch I desire to discuss is the school lunch in the elementary schools, the schools which in 1908 included 93.47 per cent of the 18,582,294 students in the United States. There is, therefore, abundant reason to consider their necessities.

The majority of children in our elementary schools need the school lunch. Lunch counters are provided in countless secondary schools for those children who, economically, represent the best home conditions and as a whole by their presence at a secondary school give evidence of at least sufficient food. In many kindergartens children bring a lunch of more or less food value that is there supplemented by milk. In schools for cripples, for tuberculous children, for defectives, it has been deemed advisable to supply lunches. Is it not equally essential to furnish all children part of the day's food so as to be certain that there is some food supplied that will tend to prevent the development of the tuberculous conditions so largely responsible for our cripples?

The true problem of the school lunch is not to relieve acute hunger or to satisfy the palate, but to relieve chronic malnutrition. It does not deal with the child who has no breakfast, or the child who bolts his food and runs to school, or the child who calmly munches a crust while sipping his lukewarm, oversteeped tea. It goes deeper into the social labyrinth and where it finds chronic undernourishment. Mr. Robert Hunter claims that "at least 3,300,000 school children under 14 years of age are underfed in the United States." Mr. John Spargo estimates that fully 2,000,000 children between the ages of 5 and 14 years live in poverty.

¹An abridgement of a paper read October 30, 1909, before the Home Economics Association of Greater New York.

Dr. Sill estimates that in Greater New York there are 555,525 children in the elementary schools and he believes that 222,210 are ill nourished. He thinks there are "1,472,895 illy nourished school children in the United States." Dr. MacMillan of Chicago found 15.9 per cent of the kindergarten children physically below par, and estimated that 11 per cent of this impairment was due to underfeeding. Dr. Echholz estimates the number of underfed children in London to be 122,000. Dr. Mackenzie regards one-third of all the school children of Edinburgh as poorly nourished. Dr. Maxwell is reported as saying to the National Education Association in 1904 that there are 100,000 children unable to learn because of hunger. Drs. Frances Warner and Hack Tuke found 28.5 per cent of London school children suffering from deficient feeding. Dr. Lechstrecker in an examination of 10,707 children in industrial schools in the state of New York found 9.32 per cent lacking in nourishment.

What does all this underfeeding mean? It means that the school lunch problem reaches to the foundations of society. As in early times it was believed necessary to immure a child in building a bridge that was to last for all time, so today society is trampling upon its own flesh and purchasing a doubtful progress by sacrificing the children. What is the problem of undernourishment? It is a malignant growth that has been thriving upon poor housing, crowded rooms, low wages, underemployment, alcoholism, poor hygiene, lack of sunlight, air, bathing, ignorance of food values, ignorance of the very laws of life and health. Acute hunger may force families to ask for aid in 60 per cent of the cases coming to organized societies, but chronic underfeeding takes its toll before the last straw breaks the back of pride and self respect.

According to Dr. Underhill, twenty-two cents per man per day was in New York City in 1907 the minimum expenditure for food permitting a normal family of five to maintain physical efficiency. Today prices are higher. Chapin in his *Standard of Living in New York City* states that in families with an annual income of \$400-\$600, 76 per cent are underfed; for those receiving \$500-\$800, 32 per cent; \$800-\$900, 22 per cent; \$900-\$1000, 9 per cent; while for those receiving over \$1000, the percentage is negligible.

The special committee on the standard of living appointed at the New York State Conference of Charities and Correction in 1907 regarded \$825, or \$16 per week, as a conservative estimate of the amount necessary to maintain a fairly proper standard of living in the Borough of Manhattan.

The effect of income on child growth is well shown by an analysis of the average height and weight of two groups of school children in Liverpool, one from a school in the wealthy district and another from a school in a district inhabited by the poor, as follows:

Relative development of school children from wealthy and poor families.

STATION OF PARENTS.	AGE 7 YEARS.		AGE 11 YEARS.		AGE 14 YEARS.	
	Height.	Weight.	Height.	Weight.	Height.	Weight.
	<i> Ft.</i>	<i> lb.</i>	<i> Ft.</i>	<i> lb.</i>	<i> Ft.</i>	<i> lb.</i>
Wealthy....	3.12	49	4.75	70	5.75	94.33
Poor.....	3.80	43	4.10	53	4.70	71.00

Bowditch noted over 30 years ago that "children of laboring classes inhabiting towns are at all ages decidedly shorter than the children of non-laboring classes attending public schools and universities, the difference attaining a maximum of over 4 in. at 13 years of age."

Part of the origin of undernourishment lies in poverty. But poverty is not the whole cause. The New York Committee on Physical Welfare of School Children found plenty of physical defects among children of families possessing incomes above the \$16 a week necessary to have a proper standard of living.

The Department of Health examined 275,641 school children in the Borough of Manhattan and found only 5.8 per cent of malnutrition. Had full investigation been made I believe the percentage of malnutrition cases would have been 35 per cent. The problem, then, is not one limited to children of poor parentage. The poor physical condition of the school child is but a reflection of home conditions. Undernourishment should be prevented from the beginning of the child's life. Not alone the child at school—but the child just too young to go to school and the baby in arms must be regarded as a proper part of the school problem. To prepare a child for school should be the first interest of the school, worthy of careful consideration by educators.

"After bread, education," wrote Hubert Bland. I should like to alter this so as to include those families where the relief question is not paramount: "With bread, education." That is basic. The school lunch problem is not in its essence a relief problem; it is an educational problem. In Paris the *cantines scolaires* are part of an educational measure. One school lunch a day, however, will not solve

the question of feeding the children. At best, such a lunch can only be regarded as an additional meal supplementing the normal number a child requires or else it becomes a substitute for one of the home meals. In either case upon the food value of the other meals depends whether or no the child is to be dwarfed mentally and physically.

If it now takes nine and one-half years for children to do eight years work, as our schools are graded, what part does malnutrition play? Are school courses graded for the underfed,—for their limited mental capacity,—for their starved memories? What percentage of absences are due to malnutrition? What diseases find welcome resting places in undernourished frames? What irritability, dullness, misbehavior are grounded in chronic underfeeding? What laggards and dullards arise from a starved mentality? What wastes of child lives, teachers' nerves, educational funds, parental hopes are due to malnutrition? The school must begin a campaign of educational economy by securing a healthier and more receptive child before schooling begins. As Bacon states, "the brain is in some sort in the custody of the stomach."

The school lunch must develop capable custodians of the brains and healthy protectors of the custodians.

Intimately connected with the problem of lunches are many important subsidiary subjects. Table ethics, table manners, and conversation are worthy of school attention. At the New York Ethical Culture School the social value of the luncheon is cultivated. The feeling of democracy and equality can be easily fostered around the common table. Mr. Sidney Webb a few years ago advocated "an article in the educational code making obligatory in the time-table a new subject, viz: 12 to 1 p. m., Table Manners (materials provided)."

At the *cantines scolaires* the teachers give such instruction. In addition to table manners one can teach the necessity of taking time to eat and to masticate, not overlooking the needs of urging dental inspection. There is the splendid opportunity of teaching domestic science, hygiene of kitchen and dining room, food values and food economics.

These subjects should not be left to normal schools where the need of school lunches is based on convenience rather than on underfeeding—and judging from the menus of many of these lunch counters, the question of education has been entirely overlooked. There will be less running home, bolting a bite of poorly prepared food and rushing back to school hungry. There will be less spending of pennies for lollipops, buns, pickles, and ice cream, and indirectly fewer absences because of the results of frequent dietary indiscretions.

There will be better air than can be had in many of the houses. Children will have a meal free from scolding, hustling, bolting, and will return to school studies with a mind prepared for work without a preliminary restless fifteen minutes. School lunches may be "inadequate to correct physical conditions that home and street environment produce," but they are "a means of insuring punctual attendance or better attention," and form a mode of reaching out toward the problems of the home and the street.

From the nutrition and educational standpoint the choosing of the school lunch is most important. Dr. C. F. Langworthy² has found that the average adult of the United States is daily supplied with 100 gm. protein, 150 gm. fat, and 350 gm. carbohydrate, with an energy value of 3000 calories. He estimates that children between the ages of 6 and 9 years require 0.5 of this amount, and those from 10 to 12 years 0.6 to 0.7. Regarding the average age of the school child as 10 years, this is equivalent to approximately 60 gm. protein and 1800 calories of energy. I believe that at least one-fourth of the total daily needs or about 450 calories should be furnished by the school lunch.

But there are many other considerations entering into the question. The food must be easily digested as well as appetizing and palatable. It may vary greatly in its component nutrients but must always supply an abundance of the various mineral constituents deemed especially valuable for the development of children, particularly lime, iron, and phosphorus. Quantitative variations must be considered as well as qualitative. The sensation of fullness is desired by the child, whatever the sufficiency in calories. There must be seasonal variations, certain foods being best relished in warm or cold weather. Local conditions must always be considered very carefully; the dominant nationality, the prevailing religion, both bringing up food problems. In general Italians like thick soups; Irish children prefer thin soup. Italians wish vegetables; Irish want meat. For Catholic children, on Friday, meals without meat must be provided. For Jewish children the laws of Kosher must be observed.

From the practical point of view one must consider the cost of the foods, the ease and rapidity of preparation, the difficulties of service, the amount of waste. From the educational point, the lunch should contain foods seldom or never supplied in the house. Tastes should be cultivated for nourishing foods that are cheap and easily prepared.

² U. S. Dept. Agr. Yearbook, 1907, pp. 361-378.

The problem of the management of the lunches is intricate. It is practically impossible to have a system of individual dishes, unless the dishes are all numbered and a number given to each child. To have each child responsible for the cleanliness of his own dishes is desirable but more easily said than done. The tickets for the lunch should be of metal and sterilized daily.

The meal having been provided the question arises, who is to eat? How may the underfed be determined? How can the poor, who are unable to pay for the lunch, secure it? How may the poverty-stricken be found? Which children require the lunches because no one is at home to supply the food at noon? The variations in children must be studied because the presence of a circus parade may diminish attendance at the lunch. A rainy day will cause a rush for the lunch, while holiday seasons cause a decrease in the attendance. Even the bell of the hokey-pokey man will call many from the good food to the second rate ice cream. If the menus are known to the youngsters in advance, some meals will attract a throng and others will entice few to the lunch table. Experience has revealed these as important conditions to be studied and mastered.

In working out a system to take care of all possible conditions the following points must be discussed: Should school lunches be compulsory and free, or available for a nominal price? Should the lunches be prepared at the school or at a central kitchen? Should the children prepare the food or should a chef be employed? Should the domestic science classes prepare the lunches? Should school lunches be supplied by the municipality through the department of education? Should the municipality supply the education and the children furnish the food? Should private philanthropy pay deficits? Should school lunches be self-supporting?

Compulsory attendance at a school lunch insures the underfed children receiving one good meal. It does not, however, have any effect upon the other meals at home nor does it correct to any great extent underfeeding. It is far from proved that school lunches are the essential part of a system to better child health. To make a school lunch available for all children at a nominal price does not insure the lunches going to those children most requiring them.

I do not believe anyone questions that the feeding of children is a function of the home. To make lunches free and compulsory is to lessen the responsibility of the home toward the child, and school

lunches should not lower parental responsibility but enhance it. It is most true that "mothers will naturally take a greater interest in the welfare of their children if held responsible for proper food and proper home surroundings than if not reminded of their responsibilities."

Nor should school lunches degenerate into food doles. The family that cannot afford to pay 1 cent to 3 cents daily for the lunch of a child requires more help than merely to supply the child with a few bites to eat. The family that cannot live up to its responsibility is worthy of investigation by a society dealing with the important problems of family relief. The low price school lunch should be made available to all children. Parents should voluntarily allow their children to avail themselves of the school lunches not as a means of shirking responsibility but as an evidence of their appreciation of the valuable lessons to be gained for the children as well as the adequate supply of food at a low cost.

By making the lunches available it becomes essential to reach back into the homes. There must be close coöperation between the home and the school whose common thought is child welfare. When social and economic conditions allow, when a sufficient knowledge of dietetics and child hygiene has permeated the home, and when the school curricula are adjusted to the physical capabilities of the children there will no longer be a need of school lunches.

Again, school lunches should not be interpreted simply as a relief problem, as that is far from the function. Unless intimately connected with the educational problem they lose much of their value. They should not discriminate, as when offered to the poor, the cripples, and the defectives. If they are of value to children they should be made available for all.

The question as to whether lunches should be prepared at the individual schools or at a central kitchen brings up an important matter of policy. If lunches are to be provided simply as a matter of relief, by relief societies or philanthropic organizations, the funds should be administered as economically as possible and a central kitchen becomes almost a necessity. If they are a part of an educational plan, then they should by all means and at any expense be provided for and prepared at the individual schools and this irrespective of who is to pay for the lunch. Obviously, if the lunches are to be of service in teaching children and their mothers, their preparation at school becomes an essential part of the plan.

Should the children prepare the meals or should a cook be employed?

From an educational point of view, there is but one answer. Let the children prepare the meals, set the table, etc., as in the elementary schools of Stockholm and at the special class schools in New York. The ideal way would be to have each grade prepare its own meals as this would allow a normal and gradual extension of training in all that pertains to food hygiene. To employ a cook is to add the greatest single item of expense in preparing lunches, particularly if no central kitchen is to be used.

Should school lunches be supplied by the municipality as part of an educational plan? Yes. I do not mean that free lunches should be distributed. School lunches should be available for all children at a nominal cost. Those children whose parents are unable to pay for the lunches in full should be permitted to pay for them in part, and the children with very poor parents should have the lunches furnished at the expense of the city. It is cheaper to feed a child in school than in a hospital or in a prison.

As part of an educational propaganda in this country private philanthropy has equipped and maintained school lunches and paid the deficits when they occurred. At present those private organizations that are prepared to serve lunches should be encouraged to continue their work and offer lunches to a larger number of children. That school lunches can be self-supporting is beyond question, but not to cover rent, initial expense for equipment, gas and service, together with the salary of a teacher to develop the educational work and the salary of a needed investigator capable of ascertaining home conditions and able to bring about a better coöperation between the home and the school. In fact if a school lunch is self-supporting, it is likely to represent merely an efficient relief organization divested of most of its constructive features. The larger the number of children fed, the less will be the deficit per capita, for the initial expense, cost of gas, etc., will be fairly constant whether 50 or 150 lunches are to be prepared.

The most important factor for the successful management of school lunches is the active coöperation of the grade teachers and principals with the domestic science teachers, the home visitors, the medical inspectors, and the school nurses, so that no underfed, undernourished, physically weak or mentally backward child may be overlooked. Personally I believe that each school should have a committee of mothers brought into close relation with the school lunch problem as an excellent aid in developing methods for the successful carrying out of plans for home education through this means.

Should the school lunch supply the whole noon meal or is it more desirable to supplement the lunch the child brings from home? Is it desirable to have a definite lunch merely of food available at a lunch counter according to the palate and inclination of the children? I do not believe that the lunch counter alone has a place in the elementary school unless children's taste can be so guided as to create a demand for more nutritious and less indigestible foods. It is very doubtful that this can be accomplished in the lower grades. The lunch box from home should always be encouraged. The school responsibility lies in educating the home so that the food provided shall be of a character suitable to supply appropriate nourishment for physical and mental development. To have the school lunch supply warm food and have the child's lunch box furnish the rest of the nutrients would be excellent. If the child would otherwise go home to a sparse and poorly prepared lunch it would be far better to encourage lunching at school until the home standard has been properly raised.

The main difficulties of home dietaries are their one-sidedness, excessive food waste, poor cooking, use of expensive foods in proportion to income, and lack of nourishment supplied in proportion to the food cost. The educational purpose of the school lunches must be to offset and overcome these deficiencies. As stated by Atwater and Bryant.³ "It is quite evident that what is needed among the families more than anything else is instruction in the way to make the little they have go the farthest."

School can develop a new order of home-makers by teaching the children. A course in foods, using the lunch as a syllabus, would result in the children learning much of future benefit to the community. Through the children knowledge of food values, cost, economy, and cooking would be introduced into their homes. By securing coöperation of mothers, by giving informal talks to mothers' meetings, by having the home visitor ally school and home more closely, the home would be bettered and made a safer home for children.

We shall know whether the work has been done well by the effects upon the children, the school and the homes. The benefits accruing to the children will be better physical development, gain in weight, lessened frequency of digestive disturbances, better manners, increased useful knowledge, less mental backwardness, better appreciation, less worry, less illness. The school will gain by more regular attendance,

³U. S. Dept. Agr., Office Experiment Stations, Bull. 116, p. 78.

fewer absences, better attention, less loss of time from the wearisome repetition necessary with dullards, fewer absences on the part of teachers owing to wrecked nerves. The school as a whole will also gain immeasurably from the closer coöperation with and understanding of the homes. The homes will be helped through the increase of their responsibility toward the children. Home standards will be raised along with the standard of living. Home health will be bettered and corresponding economic gains will arise. Not only saving in expenses, but a prodigious saving in losses now due to malnutrition, disease, and distress may be the result of an intelligent health propaganda based upon a system of school lunches.

The school lunch, then, should be merely a form of educational coöperation allowing home and school to see each other more closely and more clearly and permitting both to work together in harmony for the best development of their common charge—the children.

In the discussion which followed Dr. Wile's paper, he was asked to make a brief statement as to what had been actually accomplished, and he stated that, after numerous difficulties had been encountered, it was finally decided to get all the expert opinions and the best judgment thereon that could be obtained. A committee had been formed, consisting of the President of the Home Economics Association of Greater New York, various members of the Faculty of Columbia University, various people interested in social or other phases of school work, the supplying of funds, the general lunch problem, and others. A new committee had organized, the New York School Lunch Committee, and was carefully studying all phases of the problem with a view to its complete solution. The hardest point is apparently how to reach the children who actually need the school lunch, and a sub-committee has been appointed on this phase. Underfed children, those suffering from malnutrition, and of dull mental capacities, are to be made the subject of special inquiry. The coöperation of school principals is to be sought, and a mothers' committee has been appointed in one school to enlist the coöperation of parents.

A STUDY OF THE UNDER-NOURISHED SCHOOL CHILDREN OF BALTIMORE.

M. L. WHITE,

Special Agent of the Baltimore Charity Organization Society.

One winter, a few years ago, my window looked out upon a mission building in East London, where free breakfasts were provided for the school children of the neighborhood. Every morning my attention was attracted by the children in line, pushing and fighting among themselves, as they waited for the opening of the doors, the stronger, selfish, late arrivals striving in the scramble to take the places of any weak, early comers. Thinly clad, many of them, with foot coverings of the poorest kind, they stood in the rain and mud, or in the sharp cold winds for half an hour, or sometimes much longer. It was not an inspiring sight, and when, led by my interest in this daily morning scene, I visited some of these distribution centers the inside view was no more reassuring. It was always with a feeling of satisfaction that we were doing no such thing at home that I looked on at what was so clearly a wasteful attempt to remedy the situation, unsatisfactory in results, and in many respects harmful.

When, therefore, in 1907 the question of the underfed school child was agitated in Baltimore I was keenly interested. Less impulsive for once than our English cousins we decided to make an investigation as to the nature and extent of the trouble before determining how to meet the situation. It was thought best to take some one school in a poor part of the city and make a careful and thorough inquiry into the home conditions of the children of the school who were suffering from malnutrition.

The school selected was one where the medical inspector had reported unusually bad conditions, and where, too, the teachers were not only much exercised about these same conditions, but were ready to lend their assistance in every possible way to the inquiry. Just a word at the outset about some of the conditions prevailing in the school and the neighborhood from which the children are drawn. While located in a poor part of the city there are no doubt poorer sections, if one has the question of money in mind, but in ignorance,

in lack of conformity to any American standard of living, in unsanitary methods and conditions, in absence of ideals and ideas, in short, in real wretchedness this is, probably, as bad as any. Russian, Polish, Austrian, German and Finnish Jews made up sixty-five per cent of the children in the school with Italians next in number and Lithuanians following. Only fifteen per cent were American children.

The English language is not therefore the language of their homes—in fact, in the greater number of homes visited the services of an interpreter were required. This was, indeed, a part of Baltimore as separate and distinct from North Baltimore as if it were another city—a part of Baltimore too, that in the olden days was the home of well to do, comfortable citizens. The spacious old houses have now been converted into tenements, every floor occupied by one or more families and the modern conveniences found in the tenements of today entirely lacking. A bath room, for instance, was found only in a very few homes, chiefly those of Americans. The work was begun with a list of those children, representing a hundred families, who were apparently suffering from malnutrition, which had been made up by the medical examiner and the teachers. Visits to the homes of the children in question and careful inquiry into the financial affairs of the families resulted in reporting a few families, but not over a half dozen, to the Federated Charities as needing assistance. In all other cases the great need was for higher standards of living and more intelligence in the use of the resources at hand. Many of the children were suffering from adenoids, enlarged tonsils, bad eyes and teeth, but I felt that the many bad conditions that are described in this paper were far more important in their effect on health.

It was found that a large number of the children were addicted to the candy habit. They spent all of their pennies, and these amounted to a surprising number in the day, for cheap candy and then, as the parents complained, ate little or nothing at meals. Many of the children reported as coming to school without breakfast, were found to be in the habit of spending their evenings on the street, at moving picture shows, or other places of entertainment; in consequence of which they went to bed at a late hour and arose in the morning only just in time to get to school.

In this connection it seems advisable to speak of the respect accorded to their children by the foreign parents who are dependent on their help as interpreters for all intercourse with the people of this new country to which they have come. This dependence results in most

cases in weakening the authority and restraining influence of the parent.

As a contributing cause to the poor physical condition of the children in this school I am inclined to give third place to the unsanitary conditions under which many of them lived. When the question was put, as it always was "Do you sleep with the windows open?" the reply, almost invariably in a tone of surprise and disapproval, was "Oh, no, indeed." Where two rooms (or in some cases only one) constitute the living quarters, they serve as kitchen, dining-room, sitting-room and bed-room. A bed always stands in one corner, and a family of from five to eight people spend a part of the day and some of them the night in air that is only changed by the occasional opening and closing of the door leading into the hall. Is it any wonder that the child from such a home is pale and listless and puny?

A few children, and those almost exclusively in the American families, were found to be underfed, or improperly fed. The greater number of these children were the children of mothers who had spent their girlhood in factories. They had had, in consequence, little or no training to prepare them for their work as wives and mothers, but were women who had had to "pick up" a knowledge of cooking when the call came for it, who had never been taught how to buy the best and most economical foods or learned the many simple, but useful points, that count in good management of a home.

Another small class, almost exclusively foreign, in their efforts to save, to get ahead in the world, are denying themselves and their families the proper living conditions; they are crowded into miserable rooms, eating the cheapest food and wearing the poorest clothing. I recall an Italian family of this class, "a particularly poor family needing special attention," the teacher had reported. I climbed a rickety, dark stairway to the dingy room that they called home and found the mother stitching on trousers, too busy in her efforts to make every minute count to give any time to the care of home and children. The room was dirty in the extreme, the children in like condition and most scantily clad. The younger ones, with a pot of macaroni on a chair between them, were drawing out the pieces with their fingers and eating greedily. A poor, sickly looking baby was in the care of the older children. Fuller inquiry into the affairs of this family revealed the fact that they had several hundred dollars saved. This was the most extreme case I found but it was not an isolated one. Other foreign families represented in this school had saved to good purpose,

owned their homes, or had a business of their own while at the same time providing well for the daily needs of the family.

In a few cases where there had been illness, or the mother was a widow or the earnings of the father were squandered, there was no money to buy proper food and these families were turned over to the Federated Charities, but certainly free breakfasts or lunches for this small class would not furnish adequate relief.

I have come to believe that the children suffering from malnutrition in the different schools in Baltimore and perhaps in other cities belong to one of the classes enumerated in the study of conditions in this one school. The number in the different classes may vary in the different schools as different nationalities are represented but they are pretty surely all to be found among them. What then, is the way to meet this question of the underfed school child? How solve the problem that is growing while we consider it? To those who are working among these people there seems to be only one answer. After a careful study of conditions the cure is to be found in personal service applied patiently and persistently in teaching the parents better standards of living and how to attain them with the means at hand. Cooking classes have done much for the mothers who before marriage had no opportunity to learn to cook. Many foreign mothers do not need to be taught this art but they still need what the friendly visitor can bring them, better adaptation to conditions in this new land, more intelligent control of their children.

EXPERIMENTS WITH SCHOOL LUNCHES IN NEW YORK CITY.¹

MABEL H. KITTREDGE,
of the New York School Lunch Committee.

There is universal interest and universal effort to find a solution to the problem of school lunches. It is important, first of all, that we catch a glimpse of this attitude of mind. The public, the world over, seems to have come to the conclusion that if the State is to educate children (and even the most conservative communities now admit that it must do so) it is mere waste of money to try to educate a half starved child.

Let me quote from the several writers on this subject. Miss Caroline L. Hunt in *The Daily Meals of School Children*² asks the question whether free meals may not be a necessary means of securing that equality of opportunity for which our public school system stands, when reports from all the larger cities show that children are coming to school hungry or so underfed as to be unable to take full advantage of the instruction offered them. Lillian Wald, in *Charities and Commons*, writes: "The school lunch is not a departure from the principle of the obligation assumed by educational authorities toward the child, but an intensive application of the measures adopted for the physical nurture of the child, to the end of securing in adult years the highest efficiency of the citizen." If food were looked upon as vitally connected with health and efficiency, instead of as a means of gratifying the palate, we should think more about the desirability of imparting mental and physical health to the next generation, and less about pauperizing the parent.

Superintendent Maxwell says that there are 17,769 children in New York City suffering from the horrors of malnutrition. "How ridiculous," he adds, "to compel children to attend school when the hungry stomach will not permit them to learn." Dr. Falkner believes it is

¹ Read October 30, 1909, before the Home Economics Association of Greater New York.

² U. S. Bur. Education, Bull. 3, 1909.

this army of backward pupils who are holding back the efficiency of our public schools.

For six years in Birmingham, England, school children have been fed, first by the generosity of one man, later by the municipality coöperating with charitable organizations. In London, in 1908, definite steps were taken toward making an annual appropriation from county funds for the purpose of feeding underfed children.

Cantines in Paris are attached to all public schools, and in other cities in France this is also true. Germany raises money by private enterprise, supplemented by municipal funds, to feed her school children. In Denmark, in Norway and Sweden, in Spain, in Switzerland, and in Italy, luncheons are served to the school children, and the expense is divided between charitable organizations, the municipality, and the children themselves. In Belgium, Brussels and Holland meals are served free to all underfed school children, and all this because of a new attitude of mind toward food in its relation to education which looks toward efficiency in the child and later in the adult.

If we agree then that in some way underfed children must be nourished, if a larger part of the money spent on our public schools is not to be wasted, naturally we ask how is this feeding to be done? This our experiments have not as yet shown, but four ways are being tried as follows: First, where the expense is borne by the State, assisted by charitable organizations, many children being fed free: second, where the school board, charitable associations and the parent coöperate; third, where the municipality feeds only the underfed children; fourth, where the parents of the children bear the expense when able, charity assisting when necessary.

The fourth method we are trying here in New York City, in Public Schools Nos. 51 on West 44th Street, and 21 on Mott Street. Such children as are able to pay are charged three cents a meal, while those known to be unable to pay are paid for by outside contributions, any deficit being also covered by outside help.

The first luncheon was served in Public School No. 51, on November 23, 1908, and has been repeated every school day since. The amount of food given to each child each day has contained what is estimated as one-third of the required daily nourishment. The menu or bill of fare in this school, where the pupils are mostly of Irish parentage, was for one week as follows: Monday, one-third qt. vegetable soup with meat stock and two slices of bread; Tuesday, one-third qt. pea

soup and bread; Wednesday, rice pudding with milk and two slices of bread; Thursday, cracked wheat and raisins and bread; Friday, cocoa and a cheese sandwich.

During the 141 school days occurring between the beginning of the experiment and the end of the school year, a total of 19,013 lunches were paid for at three cents per day. A total of 1136 lunches were paid for by outside charity, and 846 lunches were furnished children free as payment for their services. The average number fed daily was 149 out of a total of 2000 children in the school. The total expense of food and service (other than administrative service) was \$715.87, the total income from sale of tickets (those paid for by the children and charity) \$706.84, leaving a deficit of but \$9.03. It cost, then, in this school, 3.4 cents a day to feed a child and the income per child per day was 3.3 cents. As 1.8 cents of this daily cost per child was for service, it is probable that an increase of attendance would make the luncheons self-supporting.

On March 15, 1909, luncheon was first served in School No. 21, at Mott and Spring streets. In this school are 2100 pupils, all Italians. An Italian cook was found to be necessary, and only food conforming to Italian customs was supplied. The menu for one week, for example, was as follows: Minestra or cabbage stew, made with oil and garlic; lima beans (dried) and postu; rice and peas, cooked with oil or lard; lentils; cocoa and meat and potato sandwich; macaroni; and in addition each day two slices of Italian bread. Since the Italian custom is to eat very little breakfast, but a hearty meal at noon and at night, the Italian child requires one-half the daily nourishment at each of these meals. He eats few sweets between meals and drinks little tea as compared with the Irish child, and comes to the noon luncheon with a good healthy appetite.

In the 65 days between March 15 and June 25, 1909, 8837 lunches were paid for by the children. One hundred lunches were paid for by charity and 586 lunches were given free of charge in return for services. The daily average attendance was 145 and the cost 4.4 cents per lunch per child. There was a deficit of \$66.78 in the 65 days.

We have found, then, that while the total daily attendance in these two schools was 4100 pupils, the average daily attendance at luncheon has been but 293. Another discouraging fact is that the children buying the noon meal are not, as a rule, the underfed children. We have also found that little help is to be gained by visiting the parents of the children that are suffering from malnutrition. The poverty,

ignorance or indifference that has been the reason for the child's physical state cannot be done away with so easily. The difficulties in the way seem to be, first, lack of authority to feed a child at school, even when medical inspection has proved that that child needs a noon-day meal. Probably, too, this authority will never be gained with pay luncheons here in America. Second, we have as yet found no way to prevent a child from spending his luncheon money for candy, so that we must constantly cater to the child's whims in order to have the lunch counter receive the three cents rather than the candy store, though the child's taste is not always in accord with the most nourishing food at the least price. It is our experience that if the Italian boy wants twice as much macaroni as can be cooked for three cents, or more than is necessary for his needs, and does not get it, he goes out and buys pickles. If the Irish child who likes thin, watery soup of little nutritive value finds barley or rice in his soup, he leaves the soup uneaten and stays away on the following day.

Has the school luncheon thus far succeeded? Not from the stand-points of business or the health of the underfed child. It does not pay expenses and the children who most need the lunch do not get it. Still the numbers patronizing it are increasing every day; the children are growing to like the food that is good for them, and the day seems nearer when a way will be found of helping underfed children whose parents are able to pay for a three-cent meal, but who do not now take advantage of the school lunch.

This, then, is the plain story of what has been done thus far here in New York City to promote the school luncheon problem. It is not a record of great achievement, but the tale of an experiment in what the future may show to be the right direction. The conditions in free America are so vastly different from those in foreign lands, where municipal regulation almost seems to have taken the place of divine Providence, that we must consider the feeding of school children a problem yet to be solved.

REPORT OF THE PENNY LUNCHES SERVED BY THE STARR CENTRE ASSOCIATION, PHILADELPHIA.

ALICE C. BOUGHTON, *Superintendent.*

The penny lunches served by the Starr Centre are of necessity restricted in character, for the variety of foods that can be prepared and served at a school without profit or loss is limited. It is a penny lunch which is needed in many schools of the slum districts, where numbers of children have but a penny to spend.

Five elementary schools are being served with the lunches—one colored, one Italian, one Jewish and two special schools, the attendance on the latter being made up of truant, backward and incorrigible boys. The equipment, management and serving of the lunches is very simple; the general arrangement is the same in all.

The lunches are under the care of a supervisor, a domestic science graduate, whose duties are to prepare the weekly menu and the recipes to be used; to investigate the source of milk and food supplies, securing special prices when possible; and to oversee the practical work by visiting the schools as often as is necessary to keep them up to the standard. She receives at the end of each week a memorandum from each school of the character and number of lunches sold, and at the end of the month a balance statement, for, since the aim of the Starr Centre is to give a few cents' worth of food at cost, the supervisor must keep in close touch with the work.

There is a woman in charge of the preparation and serving of the lunches in each school. She does the buying, pays all bills, and receives the children's money.

In the elementary schools the lunches are served during the morning recess; in the special schools at the morning recess and at noon, since the children are not dismissed until 2 o'clock. Each day there is one hot dish, either cocoa, rice pudding, bean soup, creamed hominy, or macaroni with cheese. Twice a week there is stewed fruit, apricots, prunes, peaches, apples, or cherries, either alone or with half a shredded wheat biscuit. Graham wafers, milk lunch, coffee cakes, and glazed buns are served daily, as is also fresh fruit in season.

In general, the portion served for one cent is, for the liquid and cooked foods, one cup (one-sixth quart). Another cent will purchase one apple, one orange, one banana, or a proportionate quantity of other fruits, four graham wafers, or one coffee cake or one like. In this connection it is interesting to note that the energy value of one portion of the various foods supplied has close limits, ranging, except for the fruits, from 124 to 164 calories per portion.

The cost of equipping the schools and maintaining the lunches is met by the Starr Centre from other funds so that all money received from the children is returned in food value. On the 60,000 lunches sold year before last, there was a profit of \$3.45. Last year nearly 90,000 lunches were sold with still less profit.

The need for the lunches is so apparent that it seems hardly worth while to dwell long upon it. The parents are working people whose occupations frequently call them out before the children are up; consequently the children have to shift for themselves, and it often happens that they have no breakfast, or that the pennies left them are spent for cinnamon buns, taffy-on-a-stick, or like "dainties." The Starr Centre entered this field to study these conditions and if possible to alleviate them, by substituting clean, wholesome food for that offered by the street vender, and to gain an entrance into the homes of the children so that harmful conditions might be relieved.

To carry out this plan it was found necessary to engage the services of a penny lunch visitor who was put in touch with the underfed children in one school through the assistance of the medical inspector and the school nurse. She has just begun her investigations in the homes of these children, but already some interesting facts are coming to the surface, for instance, cases where there are four well fed and one underfed child in the same family. Obviously it is not poverty nor lack of food which keeps that child back, but some peculiarity of his physique which the mother has not discovered or not known how to remedy. It seems probable that there are many more just such cases, where nothing but the actual personal knowledge of the home conditions in the case of the individual child can enable that child to be intelligently helped and permanently benefitted. Of course, the work of the visitor is not strictly luncheon work, but the best public service can be rendered only when the lunch is made the excuse for gaining access to the home to remedy conditions there, so that with the child properly fed both at home and at school we may very materially lessen the number of under nourished children in this city.

In the collection of the data a card filing system is used. A specimen blank card is given below:

SERIAL NAME		STARR CENTRE SCHOOL LUNCHEES					CROSS REF.		ADDRESS		DATE
FIRST NAME		OCCUPATION	CHURCH	BIRTH PLACE	TIME IN AMERICA	REMARKS					
FATHER											
MOTHER											
OTHER CHILDREN		AGE	SCHOOL OCCUPATION	PHYSICAL CONDITION	DEPARTMENT	SCHOLARSHIP	REMARKS	HOUSE			
								KIND			
								LIGHT			
								AIR			
								CONDITION			
								APPEARANCE			
								No. ROOMS			
OTHERS IN FAMILY		DATE	CONDITION	OCCUPATION	CONTRIB. TO SUPPORT		EXAMINED BY		PHYSICAL CONDITION		
									DATE		
BUY LUNCH		HOW OFTEN	AM'T	SOURCE	REASON	ATTITUDE OF PARENTS					
BREAKFAST AT HOME		LUNCH AT HOME									
CHILD QUESTIONED		DATE	MIND	CLOTHES	PERSON		REPORT FROM SCHOOL				
FAMILY VISITED							REMARKS				
TREATMENT		RESULT					DATE				

NOTE.—Through the courtesy of the board of health a special medical inspection for nutrition was made of the children in one school, nutrition not being ordinarily considered by the medical inspector when he visits the schools.

BOSTON HIGH SCHOOL LUNCHES.

MRS. MARY H. MORAN.

Director of the New England Kitchen.

The story of the beginning of lunches in the high schools of Boston is the story of the beginning of the school lunch movement in America. In 1894 an agitation which had begun some time earlier, under the leadership of Mrs. Ellen H. Richards, resulted in the passage of an order by the Boston School Board to the effect "that only such food as was approved" by them "should be sold in the city school houses." Mrs. Richards' interest had been aroused by a recognition of the educational opportunities that lay in the serving of properly prepared food, as well as the possible danger that lurked in the food which the children were purchasing from the corner groceries, push carts and in one or two instances from stands of "goodies" installed in the school buildings by the janitors. As a matter of fact, it was the business enterprise shown in these last instances that brought most forcibly before the school board and other interested members of the community the need of uniform lunch facilities in the city's high schools and of proper supervision to hold the lunches to a good standard.

By the plan finally adopted, the lunches were prepared under the supervision of Mrs. Richards at the New England Kitchen. From this point the "finished product" was distributed to nine high schools where counters and simple equipment for reheating and serving were installed at the expense of the city. With the exception of fuel, some janitor service, and the renewal of stationary equipment, the work was not further subsidized by the city. The New England Kitchen owners assumed all financial responsibility, including the initial cost of equipment, etc. The selling prices were low but it was planned from the start to put the enterprise on a business basis to the extent of making the receipts cover all expenses. The menus were simple and fell within such limitations as were imposed upon the scheme by the system of preparation at a central plant and transportation to the several distributing centers, but all dishes were made as nourishing as possible, the recipes being carefully worked out, under Mrs. Richards' supervision, with this end in view.

This, practically, was the organization under which the enterprise was carried on for thirteen years, an enterprise admirably conducted

from the point of view of science, education and public spirit, and which undoubtedly inspired and influenced the spread of the school lunch movement throughout the country.

With the taking over of the New England Kitchen in 1907, the Women's Educational and Industrial Union became sponsor for the school luncheon. By an agreement with the school committee, the lunches are provided at cost and the work is under the general supervision of an advisory committee on school lunches, made up of three representatives of the Union and three high school head masters elected annually by the Association of Head Masters of Boston High and Latin Schools. With this exception, the present plan of organization is practically the same as the original one, although the increased volume of business has been in proportion to the growth of the city's high schools. Today luncheon for upwards of four thousand children is being distributed through fifteen schools, situated within a radius of five miles from the kitchen. The problem of providing for the smaller outlying schools, where the patronage is small and the cost of transportation large, is met by applying against the deficit at these points the surplus from the central schools where the larger numbers fed, decrease in cost of transportation, etc., lower the per capita cost. This is one illustration of the benefit that accrues through the centralized system that makes possible uniform service in every district of the city.

An actual menu selected at random from the menus for a week follows:

MENU, Boston High Schools, February 11, 1910.

Tomato bisque soup with two soda crackers.....	5c.
Cocoa with whipped cream and two graham crackers.....	5c.
Sliced ham, egg or lettuce sandwich (large).....	5c.
American cheese or jam sandwich (small).....	1, 3c.; 2, 5c.
Crust sandwich, two with milk or three without.....	5c.
White or graham bread and butter sandwich (large).....	1, 3c.; 2, 5c.
Buttered date buns.....	1, 3c.; 2, 5c.
Coffee rolls.....	1, 3c.; 2, 5c.
Fish hash.....	5c.
*Milk with any two-for-5c. article.....	5c.
Vegetable salad.....	5c.
Cup custard.....	5c.
Stewed apricots, whipped cream.....	5c.
Plain frosted cake or gingerbread.....	1, 3c.; 2, 5c.
Oranges and bananas.....	1, 3c.; 2, 5c.

Macaroon ice cream.....	5c.
Salted peanuts.....	5c.
Molasses popcorn.....	5c.
Sweet chocolate (6 tablets).....	5c.

Units of measure per order as follows: Milk and soup $4\frac{1}{4}$ orders to the quart; vegetable dishes 4 orders to the quart; meat and fish 5 orders to the quart; Jellies and puddings 6 orders to the quart and stewed fruits and salads 8 orders to the quart.

*Much use is made of this opportunity for selection.

With the exception of popcorn, crackers, chocolate tablets and ice cream, everything served, including bread, is cooked at the New England Kitchen. The supplies are bought with those used in the Union's lunch department—an arrangement that makes the cost of raw material lower than otherwise would be possible; the workers are on a maximum eight hour day and come under the "Union's" standard of wages, vacation allowance, etc.—a standard that is equal to what holds in the best restaurants in Boston. As to standards of cleanliness, it was learned recently that the Board of Health records show the New England Kitchen bakery to be the "best of its kind in the city."

Particular attention has been given to the milk supply for the lunches. Through the coöperation of Mrs. Charlotte Barrell Ware, well known in Massachusetts as owner of the "Warelands" farm and dairy, the milk is drawn from a tuberculin-tested herd in a dairy in which first class sanitary conditions are maintained under Mrs. Ware's immediate supervision. This means an expensive milk supply when the cost of service and transportation is added and the milk is sold at a financial loss.

The packing of three to four thousand lunches daily, in a space of three hours, calls for the closest kind of organization of time and effort. The average daily output includes 100 quarts soup, 200 quarts cocoa, 1300 sandwiches, 200 buns, 1000 coffee rolls, 100 loaves cake, 200 cup custards, 100 quarts ice cream, 500 orders of "special" hot dishes (macaroni and cheese, beef stew, fish hash, etc.) and 200 orders of "special" dessert (jelly, pudding, stewed fruit, etc.)

Transportation is in the main by express; in three instances the lunches are sent by messenger via trolleys. The express companies return the "empties" from the nearby schools daily, together with the left-over food.

Lunch room quarters are provided in each school, equipped with serving counter, gas stove, sink, and in a few instances with a portable ice box. In one lunch room there is a sanitary drinking fountain. The type and adequacy of counters and equipment, together with the location and furnishings of the lunch rooms, vary greatly. Boston, like most large cities in the East, has the problem of congestion in the central schools to face, but, while the conditions in the older schools are far from satisfactory, the appreciation by the school authorities of the value of proper lunch facilities is shown in the splendid accommodations provided in the newer schools.

The method of serving is practically the same in all the schools. Paper checks, which are used only once, are sold by student cashiers. The menu is posted on blackboards and the patrons are served from the counters, which in the larger schools are divided into two or even three serving centers. As the average recess period is only twenty-five minutes, emphasis must be placed on expeditiousness. On one occasion three hundred children were served in six minutes.

The organization and administration of this work, carried on as it is on a basis of close coöperation between a public and a private institution with a common purpose—education—has large social significance, a significance that is equally strong from the view point of industrial and of social economy in relation to public work. In these days of social and industrial unrest, such examples of the utilization of organized private interest and efficient service for the public good, have peculiar value and seem to point the way to a hopeful line of effort toward the solution of some of our social problems. By maintaining this basis of coöperation, particularly at the points of contact with pupils, teachers and masters, it is possible to turn another valuable supply of interest and enthusiasm into effort for the common good. A recent experiment in a few of the schools in the formation of local committees of teachers and pupils with certain duties and powers in connection with the management of the lunch rooms, has met with sufficient support and interest to justify an extension of the plan and seems to hold promise for some effective work later. By means of such interest, new avenues into the field of school lunch work will open which heretofore have been closed because of lack of strong public opinion. Use of the lunch room plants in connection with the courses in chemistry, hygiene, domestic science and decorative art would certainly make for effective results in practical work, while a utilization of the possibilities for aesthetic and social training in connection with the lunch room would enlarge the field for cultural work.

SCHOOL DINNERS IN LONDON SCHOOLS.

GWENDOLYN STEWART.

The problem of providing school dinners in the London County council schools of London and throughout England, is one of the live questions of England. If it were a problem merely of providing dinners for all the children it might be less perplexing. But the English fear to relieve the parents of any further responsibility in the care of their children. In some schools, therefore, the children are divided into two classes, the paying and the non-paying or "necessitous" children. At a general meeting of the Board of Managers and the teachers the various cases are gone over and the merits of each class decided. A two pence dinner is provided for both classes.

It may be of interest to describe how these two dinners are provided in one group of London schools. The dinner for the paying children, about fifty at present, is provided in the school containing the domestic economy center. The food is prepared by the cookery classes which meet, for periods of three hours, each morning and afternoon. On the day visited, a meat dish had been thus prepared the preceding afternoon. In the morning of the day itself, the cookery class had a lesson on bread-making but "between times" they prepared milk puddings and potatoes.

The advantage of this method is that the girls in the cookery class each prepare a dish of some size which they can easily repeat in their own homes. The disadvantage is that they do not necessarily taste what they have prepared, and a more grave consideration, that they spend considerable time in doing mere routine work.

This dinner is served by the caretaker and his assistants. The assembly hall is converted into a dining-hall, for the moment, by means of trestle tables and benches.

The dinner for the non-paying or "necessitous" children, of whom there are nearly four hundred, is prepared by a staff of regular employees. The kitchen and scullery in the basement of the house used for the housewifery center is utilized for this purpose and the dinner is served in a mission hall across the street. The wife of the minister

in charge of the mission is in charge of the dinners and she has various voluntary helpers who come in during the dinner to assist in keeping order and in giving personal attention to the comfort of the children. On the day of my visit a visiting nurse was there, who gives up part of her noon hour to watch over the smallest girls.

Before the children begin, grace is said and, as soon as one table is ready to leave, "return thanks" are given. As the children enter and leave the room a pleasant "good morning, miss" is said to those ladies near the door.

The menu for the week for these "necessitous" children is as follows: Monday—Irish stew, baked currant pudding; Tuesday—pea soup, baked jam roll; Wednesday—shepherd's pie, boiled currant pudding; Thursday—minced meat and potatoes, plain suet pudding; Friday—"toad in the hole" (meat in batter).

The food is placed on the plates ready to be eaten. One large slice of bread is served to each pupil at each dinner.

At another cookery center, the food cooked by the pupils supplied the dinners of twenty "necessitous" children. Here the white cloths were neatly laid on the desks, with white-metal spoons and forks. At least two courses were always served, and more if the supply warranted. The cookery instructor personally superintended every lunch. In this way she lost the opportunity of rest during the noon hour, but did so willingly in order that her center might be a success.

In a third cookery center visited, the pupils prepared food for fifty children which was carried by the caretaker to a mission hall nearby. The instructor here felt that the work of the center was really improved by the undertaking of this practical problem. She felt sure that the children lost nothing of value in time and experience, but, on the other hand, gained in earnestness and enthusiasm as well as a keener appreciation of the value of the work of the classroom. The lunch prepared on the day visited consisted of "toad in the hole," potatoes and suet dumplings, of which each child had made five. Fourteen children were in the class.

In still another group of schools, the lunch was provided for in a mission hall, but a man was in charge, with fourteen helpers. The dining tables were neatly laid with white cloths, flowers, soup plates and spoons. Grace and "return thanks" were given by the children. The order of the meals was soup with bread, twice a week; Irish stew, twice a week; and currant suet pudding, once a week. Two or three helpings to each child were allowed. The food, steaming hot from

the kettles, was served from three side tables. The children, selected by the care committee, generally numbered about three hundred, although sometimes as many as four hundred were fed. The cost of feeding them averaged two pence (or four cents) per child.

This account can not be considered as in any way at all comprehensive as to the general method of providing dinners to the school children of London. It is simply an account of the effort on the part of the board of managers of some groups of schools to provide the poor children with a good dinner.

Formerly, at the first group, as at others, the dinners were provided by a catering company, but this proved so extremely unsatisfactory, both as to the quality of the food and method of service, that this group gave it up and tried the more personal effort already described.

There is a feeling on the part of some of the managers that it would be far better not to divide the children according to the welfare of the parents, but to provide the dinner at each school for all, irrespective of pecuniary condition.

A CONTRIBUTION TO THE BIBLIOGRAPHY OF FEEDING CHILDREN.

The following list of titles of recent work is designed to supplement the bibliographical data included in Miss Hunt's¹ *Daily Meals for School Children* summarized in an earlier number of this Journal.²

Some Common Errors in the Diet and General Hygiene of Children. A. F. Voelcker. (*Brit. Med. Jour.*, 1907, No. 2404, pp. 181-185.)

Improper Feeding of Cardiff Children. (*Brit. Med. Jour.*, 1907, No. 2404, pp. 226, 227.)

A Plea for the Use of Oatmeal in the Dietary of Children. C. Watson. (*Brit. Med. Jour.*, 1907, No. 2417, pp. 985, 986, figs. 2.)

The Nourishment of Youths of Both Sexes in the Family and in Educational Institutions. P. Legendre. (*Rev. Soc. Sci. Hyg. Aliment.*, 3 (1906), No. 3, pp. 450-468.)

A School Luncheon. A. L. Benedict. (*Dietet. and Hyg. Gaz.*, 23 (1907), No. 7, p. 404.)

How a Five-cent Lunch is Cooked and Served at the Honolulu Normal School. Marion Bell. (*Boston Cooking-School Mag.*, 12 (1908), No. 6, pp. 292, 293.)

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Some Figures [Regarding the Nutritive Value and Cost of Food served in a Student Boarding Club]. Agnes Hunt. (*Ill. Agr.*, 12 (1908), No. 5, pp. 146-148.)

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Duration of Life and its Relation to Growth and to Nutrition. M. Rubner. (*Das Problem der Lebensdauer und seine Beziehungen zu Wachstum und Ernährung*, Munich, 1908; also *Arch. Hyg.*, 66 (1908), Nos. 1-2, p. 127. *Sitzber. K. Preuss. Akad. Wiss.*, 1908, II, p. 32.)

¹ U. S. Bur. Education, Bull. 1909, No. 3.

² Jour. Home Economics, 1 (1909) No. 4, p. 363.

ECONOMY OF MATERIALS IN DOMESTIC SCIENCE TEACHING: THE SCHOOL LUNCH.¹

TEACHERS COLLEGE, NEW YORK CITY.

MAY B. VAN ARSDALE.

I am asked to speak particularly of the "utilization of cooked material"—one phase of the economy of materials in domestic science teaching which we are considering in our classes in foods and cookery at Teachers' College—so I will simply relate the results of our experiments during the semester.

In one of our more advanced classes we were particularly opposed to the idea of working with the divided recipe. It was thought that each student—having passed through the elementary work—needed much practice in handling materials in quantities at least as large as the family recipe. Naturally each student in a class of thirty could not be supplied with any such quantity of material unless some avenue could be found for its utilization. As we were working on the sugars at the time, we planned to make our candy in large quantities and sell it. Each student made one or two full recipes, the odds and ends were used for tasting and the most perfect products were put on sale, with the result that we realized much more than enough to pay for all the raw materials used in furnishing practice and experience for the students.

Our next utilizable product was marmalade. This we made as a class exercise, participated in by two divisions, one taking up the work where the other had left off. After each student had been supplied with the usual quantity for tasting we had remaining some forty large jars and one hundred and twenty-five small glasses. We had no trouble in disposing of these at a sale for a reasonable price, but a good profit.

Another class—one of our smaller sections at the time—wished to make custards in family quantities if they could be disposed of. We found a market for sixty-six of these in the Horace Mann lunch room. We found a demand there also for all the cookies we could supply as well as for two dozen sponge cakes and about three hundred Parker House rolls. Consequently each student had opportunities for making all of these things in much larger quantities than she would otherwise have been justified in using. By this time we were asked to fill orders for cakes, cookies, etc.; but these we refused unless the work could be made of educational value to the student. We kept a list of the topics on which we found each student most deficient. When an order for sponge cake was received (it was not solicited) it was accepted provisionally, and the students who had asked for more practice in

¹ A symposium chiefly based on papers presented at a sectional meeting of the Boston Convention of the American Home Economics Association.

that line were given the opportunity to try again. The experiment justified itself. When Thanksgiving time came, we were naturally in some of our classes working on poultry. A request came from another department of the college that we roast two extra chickens and a turkey. The filling of this order gave our students additional practice, for, after using one fowl for demonstration purposes, the others were turned over to a small division for group work. While one of our classes was doing breads, a request came that we furnish two hundred buns for a college function. This order was readily turned into a class exercise—otherwise we would not have considered it at all.

Toward Christmas we decided to utilize in a Christmas sale the available work of all the classes. One section furnished fruit cake, plum puddings, and candy; another cookies; and still another mince meat and marmalades.

So far the experiment has proceeded. We hope to continue it after the holidays, utilizing the results of our institutional cookery at the lunch room and dormitory, and possibly for a luncheon in our own table service laboratory.

In conducting the work along these lines we feel that the advantages to the students have been numerous. For one thing, the economic aspect has been continually in mind. The students have calculated the cost of the recipe, the cost of the yield, the cost per dozen, the cost of the fuel, the reasonable percentage to be charged to equipment, the reasonable profit, etc. Our sale price has been compared with the regular market price, and reasons for differences noted. Another advantage to the student in this method of treating the subject lies in the incentive furnished for good workmanship. Nothing can be accepted as a salable product which is not of a high standard of excellence and which does not creditably represent the class work. It also does away with the idea that everything one cooks is one's own, and furnishes the higher motive of doing oneself credit by cooking to please someone else.

The handling of material in larger quantities has everything in its favor, for the conditions are in every respect more normal. Under ordinary conditions this cannot be justified, on account of the expense, unless an avenue for its disposal can be found. If the returns from the sale of such products do nothing but cover the increased cost of the larger quantities of raw material, it has justified itself in furnishing larger experience to the student—but if it could be shown that from the sale of such cooked materials, a course goes far toward paying for itself, this would be an argument for a reduced laboratory fee, which would prove an added advantage to the student.

KANSAS STATE AGRICULTURAL COLLEGE.

MRS. MARY PIERCE VAN ZILE.

I do not claim originality for the plan of work adopted at the Kansas State Agricultural College. That it is practical I can assure you, for the plan adopted five years ago has been followed with satisfaction ever since, although so many changes have been made that at present it would scarcely be recognized as the original. We still see imperfections, and are gradually trying to eliminate them.

All girls taking the domestic science and art course, which includes 90 per cent of all the girls who graduate from our college, are at some time during their course

given four weeks practical training in housekeeping. The enrollment of the college is 525, and with such large numbers we must necessarily shift the girls at the end of the four weeks. To make this possible, we have in our beautiful new building, rooms especially arranged for this purpose. They consist of one large practice dining room, 40 x 30 feet with eight small kitchens opening off from it. The furniture of the dining room is such as would be found in any dining room. Each kitchen is equipped with necessary cooking utensils, china, silver and linen for a family of four. This equipment has been carefully selected, the aim being to have such things as will teach the correct table service, and at the same time have nothing that the average home may not have. The girls are given charge of these kitchens and assigned the duty of preparing and serving meals. Each girl is given a stated sum of money (\$4 per week) with which she must meet the expenses (laundry and gas excepted) of serving five meals to four persons. It is really remarkable how great pride and what great rivalry there are among the girls to see who can serve the best meals for their \$4, and excellent results follow. One of the girls is housekeeper, and it is her duty to plan, with the teachers, the meals that are to be served, and also to do the marketing. Staple articles are sold by the school to the girls at market prices, but all of the fresh meats, fruits, etc., they buy at the markets.

The meals consist of one formal five course dinner, one three course dinner and three luncheons. They are served to faculty members who come regularly and are glad to pay for the privilege. The meals are all served at noon. Besides meeting the convenience of the guests, this enables the girls to work on schedule time. They must plan menus, do their own marketing, prepare and serve the meal and wash the dishes, and leave the kitchen in order for the next day. They work in groups of four, one being housekeeper, another waitress, a third cook, and the fourth assistant cook. At the end of each week an exchange of duties takes place and at the end of four weeks these girls take up another line of work and four other girls are assigned to the kitchen.

We must therefore serve these meals six months out of every school year in order to give every girl the opportunity of doing this part of our work.

An accurate account is kept of the material used and afterwards the nutritive ratio and calorific value of each meal is computed. This is chiefly of value to teach the method of computation, for with the time at our disposal it is an impossibility to keep an accurate account of the wastes. We do feel, however, that the training received in these computations is of direct advantage in their course in dietetics which comes later.

This housekeeping course also furnishes the means of applying principles and lessons taught in an earlier course in color and design. Place or menu cards are used at every meal and the girls are responsible for making them. Very often something really artistic and beautiful results from their efforts.

We are willing to recommend this method as one way of giving good practical training in housekeeping, with practically no expense to the state. The course, as will be noted, includes planning menus, marketing, preparation and serving, including ways of using leftovers, keeping accounts, and general care of the kitchen and dining room.

I might also speak briefly of my experience in Chicago of utilizing the cooked materials from class work by selling them at a school lunch counter. The school was so situated that the students came long distances by trolley and could not well go

home for lunch. To meet the demand of the parents to make it possible for the students to obtain a warm lunch at the building, the board established a cafeteria lunch room. It was in the charge of a trained woman who had the entire responsibility of preparation and service, but the domestic science classes were frequently called on to help. The plan adopted was, briefly stated, as follows: At the close of each week I gave to the woman in charge my outline for the following week's work. She looked it over, and wherever any article to be prepared could be utilized at the counter, the classes made sufficiently large quantities to meet the demand. The plan worked well and while not nearly all of the expense of the department was met in this way, it was a help towards it. I do not know that I should recommend the scheme, because it has its drawbacks, but it might serve as a suggestion to some one who has the problem to meet.

MACDONALD INSTITUTE, GUELPH, ONTARIO.

MARY URIE WATSON.

Macdonald Institute offers a short course of three months, without entrance examinations or certificates. The majority of the students taking this course go back to their own homes to put their knowledge into practice. The work is individual, though the class is large, and every effort is made to let each girl carry out the practical work of the 48 cookery lessons on quantities sufficient for a small family.

This means a large amount of material, but the expense is greatly lessened through the cooperation of the housekeeper of Macdonald Hall, the women's residence. The cookery instructor makes out her plans, carries them to the housekeeper and inquires if the cooked dishes can be utilized. If so, the housekeeper of Macdonald Hall delivers the raw materials to the class-room and the teacher is responsible for the delivery of the cooked dishes to Macdonald Hall.

In this way the foodstuffs are utilized as far as possible without subordinating either the students to the daily needs of Macdonald Hall or Macdonald Hall to the class-room requirements. It requires the interested coöperation of the housekeeper, but the plan works satisfactorily.

HEBREW TECHNICAL SCHOOL, NEW YORK CITY.

ANNA P. HUTCHINS.

At the Hebrew Technical School for girls in New York City, the teachers of the school are served a luncheon which has been prepared, in the main, by a class which comes to the kitchen for a forty-five minute period previous to noon; but, in so far as possible, the work of the regular cooking classes is also used for this purpose.

An example or two will probably make this clearer. Rice which was cooked by one of the classes was kept hot in the fireless cooker from 10:15 until 12 o'clock when it was served as a vegetable for lunch. Again chocolate cornstarch pudding was put into individual molds and served the next day for dessert. Baking powder biscuits, muffins, cakes, etc., are all kept and used in the same manner.

The questions now arise: "How does this lower the expense? And what is the

effect on the girls, and upon the work by this method of procedure?" In answer to the first question I would say that each teacher pays 15 cents for her luncheon which buys the material used in the classes in preparing the luncheons. It is only those lessons, the product of which cannot be utilized in this way, that are paid for by the school; for instance such a lesson as that of omelet making.

The jellies, jams, preserves, etc., made in the cooking classes are afterwards sold to pupils, teachers or patrons of the school at a figure that covers the expense of materials used. There is always a surplus from the luncheons which goes toward covering the expense of breakage and other incidental expenses.

The following statement will give an idea of the income and outgo. During the months of September, October and November there were served 1526 luncheons at a cost of 15 cents each, bringing in \$228.90. There was paid out for milk and ice, \$37.24; groceries, \$123.29; the baker, \$24.01; and the butcher, \$24.65, making a total expenditure of \$199.19, and leaving on hand \$29.71.

As to the girls' attitude toward this method, it is gratifying to say they greatly enjoy this aspect of the work as their labor has an importance attached to it that could not possibly be the case if they knew the product was for themselves alone. The knowledge that others are to judge their work and profit by it tends to make them more careful.

Instead of the spirit of the work suffering, as some contend, it seems to add that touch of helpfulness to others that is so sorely needed, and it naturally gives to the girls the feeling that they are helping in a small degree at least, to support the school that is doing so much for them.

TRADE SCHOOL FOR GIRLS, CAMBRIDGE, MASS.

HELEN G. FLAGG.

My contribution to the discussion will be in the form of a description of the plan that is now being carried out very successfully at the Cambridge Trade School for Girls. In this school, every girl, even though she is taking the dressmaking course, is required to take at least one cooking lesson a week.

The cooking class prepares each day some simple dish that can be served to the rest of the school at noon. These dishes include cocoa, soups, stews, vegetables in many forms, scalloped dishes, salads, and simple desserts, such as jellies, bread puddings, shortcakes, and gingerbread, and on festive occasions, ice creams and sherbets. Every girl is served with one such dish three times a week—the rest of her luncheon being brought from home—and she pays for this extra dish at the rate of ten cents a week, or three and a third cents a day. This expense we expect every pupil to meet, and without exception we find the girls are very glad to pay this for the privilege of having something hot to supplement the cold box luncheon. At times, when there has been a larger quantity of food cooked than is needed to serve the regular customers, we even find a good deal of competition among the other girls as to who shall have the privilege of investing three cents in a cup of soup. Any girl may at any time buy a glass of milk for two cents.

The serving of the luncheon by the cooking squad offers training in setting the tables and serving attractively, and adds a home touch which we consider most valuable. It is with great satisfaction that I hear of the practical application in the home of lessons learned at school. Only a fortnight ago an agent of one of our

charity organizations reported to me that one of her girls had set the table at home on Thanksgiving Day, and in serving the dinner had followed, as far as possible, the instructions she had received at Trade School. Although our primary object in introducing cooking into the Trade School was not to train for domestic service, nor even, primarily, to make better cooks, yet if we can, by introducing a little of this work, arouse an interest in the proper care of the home, the work will not have been in vain.

In addition to preparing something for the school, the girls of the cooking class prepare complete luncheons for four of the teachers at a cost of ten cents apiece a day. These luncheons are arranged on trays and carried upstairs. This enables the cooking teachers to give a little instruction as to the preparation of a tray for an invalid. A typical tray luncheon would perhaps be cocoa or soup with croutons or crisped crackers, salad or scalloped dish, and dessert. Often there are muffins, custards, and other dishes which, because of the difficulty in preparing them in large quantities, or because of their cost, cannot be served to the girls for three and a third cents. All dishes prepared at the school, however, are such as can be used by an average family of very limited income. During the ten weeks that the school has been in session the income from the luncheons has covered the cost of all the supplies used, and there is even a slight balance in the treasury. To do this, the teacher has to plan carefully, but this planning to make both ends meet is valuable training for the girls, and we approve of acquainting our girls with figures.

The serving of the luncheon gives an added interest to the cooking class. The lesson begins at 10:30 and the class realizes that at 12 o'clock a troop of hungry girls will sit down at the tables and expect something to eat. The responsibility rests with the young cooks to see that the gingerbread does not burn, and if a girl cannot figure three times the rule, or if, for any other reason, she uses too much of any ingredient in the soup, something must be done in the emergency. These are problems that face every housekeeper, and if we can train our future trade workers to meet such problems, to enjoy their work in the kitchen, to prepare at small cost nourishing food and so contribute to their physical welfare, we shall have trained not only good housewives, but valuable employees in any industry.

FAIRHAVEN (MASS.) HIGH SCHOOL.

EUNICE E. STRONG.

In describing the work as carried on in the lunch room of the Fairhaven High School, I should like first to give an idea of the room in which the luncheons are eaten. It is a room about 75 ft. long and 35 ft wide, in the basement on the south side of the building. Perhaps the word basement may give a wrong idea, as school basements are often untidy and gloomy, but this room is an exception, as there are 16 windows on the south side, and on a clear day the sun pours in and makes it very cheerful. This long room has in the middle two large archways, so that the west side is used by the girls and the east side by the boys. In the center on the north side, and extending out a little into the room, is a serving room. A marble counter extends around the side opening into the lunch room, and on this counter is placed the food. The cooking is done in the domestic science laboratory across the corridor and then brought to the lunch room. In this serving room are drawers and closets, a sink and two gas burners.

Luncheons are served to both teachers and pupils, but not at the same time. The pupils are not obliged to purchase their luncheons, but may bring all or a part from home. Twenty minutes is allowed for recess and at 11:35 everything is ready—the menu written on the board, and the food ready on the counter. The pupils take trays and napkins and serve themselves very much as they do at the Horace Mann School in New York City, but instead of paying cash at the end of the counter after choosing the luncheon, one-cent tickets for the amount purchased are left with the boy in charge. The tickets come in long strips, and are purchased in lots of at least ten from a boy in another part of the room. After the luncheons have been eaten, the trays at each table are stacked in one pile by the last pupil at the table and later collected.

A very simple, but at the same time nourishing luncheon, is served at a very low price. The following foods are served daily: milk; soup, chowder, cocoa, milk toast, or other hot dishes; a sandwich—usually meat or egg; a plain bread and butter sandwich. Twice a week ice cream and cookies, and three times a week, a pudding or fruit are served. Some of the menus used since September 1 are as follows: corn soup, milk, plain sandwich, beef sandwich, ice cream, cookies; fish chowder, milk, plain sandwich, lamb sandwich, bananas; vegetable soup, milk, plain sandwich, lamb sandwich, chocolate pudding. The prices charged may be interesting: milk, 1 cent a glass; soup, 2 cents a cup; cocoa, 2 cents a cup; sandwiches, 3 cents each; bread and butter, 2 cents; fruit—banana, orange, apple, 2 cents; two crackers for 1 cent; ice cream, 4 cents; puddings, 3 cents.

At 11:55, after the pupils have finished and left the room, one table is set with linen and silver, etc., for the teachers who have afternoon classes, and a regular luncheon or dinner is served. Usually the same kind of soup is served to both teacher and pupils. After the soup there is meat—steak, chicken, chops, or a roast of beef or lamb—with at least two kinds of vegetables. The dessert is usually the same as served the pupils, thereby saving time and work. If fruit is served the pupils, however, a dessert is prepared for the teachers.

The regular school session closes at 1:30 and at 1:40 a second luncheon is served for the teachers who were unable to eat at the first table.

Some of the menus used this fall are as follows: Tomato soup, roast beef, beets from the school garden, mashed potato, custard rice pudding; fish chowder and crackers, lamb chops, mashed potato, creamed cauliflower, baked apples and cream; beef steak, corn from the school garden, scalloped potatoes, cocoa, fruit jell. Bread, butter and milk are served daily. The teachers are charged twenty cents for the luncheon.

I am unable to state just how much it costs to carry on this work in the lunch room, as the accounts for lunch room and cooking school are not kept separate. The idea is not to make money from the lunch room, but to prepare good luncheons for as small an amount as possible and still about cover the cost.

In answer to the question, "Who prepares these luncheons, the pupils who take domestic science?" I am sorry to say we are unable to have these pupils do very much, because all the high school cooking classes meet in the afternoon. The eighth grade pupils have never had cooking before so that they can do very little. Two assistants therefore prepare the bulk of the luncheon.

The boy who sells the luncheon tickets is in the commercial department of the

school and so is having some practical experience related to his course. In fact all accounts for the domestic science department are in charge of the commercial department.

NEW YORK CITY PUBLIC SCHOOLS.

MABEL CAMPBELL.

"What do you do with the 'stuff' the girls cook?" is the question most often asked by the visitor to the public school which has domestic science classes.

Of course one naturally resents having the good dishes one has taught called "stuff" and one answers by explaining what a small portion each girl makes and that she owns it the same as her map, drawing or composition.

One of the reasons for having domestic science in the public schools is to influence the home-life. To get the girl's mother to see that she is learning something which is practical and which will improve the home-life is a problem constantly before the domestic science teacher. She cannot visit the homes of four hundred girls and demonstrate bread, biscuit, custards, stews, preserves, table service, laundry work and so on through a two years' course but she is able to send home samples of good food.

Nowadays people do not buy goods until they have at least seen a sample. The candy maker invites one to try his cream peppermints made fresh on the premises knowing that for him the sales will be in proportion to the number of samples eaten. The demonstrator attests to the value of the "taste, try and buy" method of introducing new brands or of keeping old reliable ones well-advertised. The breakfast food man sees that a trial package reaches your kitchen and he pays well to accomplish that end.

We can learn a lesson from these shrewd advertisers and in our turn devise means of getting our ideas into the homes. We have a better medium than they for we have hundreds of messengers who insist on a hearing and tasting. Little Jane comes dancing in, opens her bag, takes out a muffin, roll, bun or cake and mother immediately becomes interested and readily consents to let her try the recipe at home. Thus home becomes the practice department for the lesson taught in school. Colonel Parker has said in this connection that they take the school home with them and when education penetrates the home and home penetrates the school, things move on.

In my classes the girls may take home any dish that will be in good condition when it arrives there. New paper bags are used for bread, rolls, muffins, tea biscuits, cakes and candy.

For foods which are cooked in small dishes such as custards, bread puddings, scalloped vegetables, casserole of rice and meat, the girls bring their own dishes, bowls or cups without handles, and the food goes home in the "original package," covered with waxed paper. There are other foods which are taken home in covered jelly-glasses or in dishes carefully protected from the dust. These are baked and stewed fruits, soups, stews, salads, and shortcakes.

The remaining foods, those which must be eaten as soon as cooked, are served in class. This gives a fine opportunity for lessons in serving and table manners as the class and teacher eat from the best dishes, with silver spoons or forks, and with paper napkins for table cloths.

There are always some children who will not eat the food served in school dishes

because of religious scruples and they welcome the opportunity to bring a dish from home. When the food is served in class I always accept the statement, "No thank you, I am not hungry" without question and tell them to give it to a friend who is hungry.

A lesson on a school lunch box is always welcome and is a favorite one with the girls. It is one way of improving the lunch prepared at home for school children. If one doubts the need for this lesson, one should watch school children struggling with "hunks" of bread, hard rolls, sandwiches wrapped in newspapers, and the like. Then one will no longer wonder that they hide what they are eating when you approach. Paper napkins cost only ten cents a hundred, paper bags five cents a hundred, waxed paper comes a cent for ten sheets. These will glorify plain bread and butter sandwiches and an apple into something to be proud of.

The home work book in which is recorded the work done at home according to the direction learned in class is always in demand. The comments show that it is used, as well, and that the work is much appreciated in many homes.

MANUAL TRAINING HIGH SCHOOL, BERLIN, ONTARIO, CANADA.

KATE L. FISHER.¹

At this school a soup kitchen is conducted by the household science department. A vegetable soup is served at 5 cents per bowl, and cocoa at 2 cents per bowl. We have not yet attempted to serve anything else, as the students supplement this with a lunch brought from home. There has been a small profit at these prices, which up to the present has been used in buying equipment.

An order sheet is supplied in the office which the students sign at any time before 9.40 a.m. The sheet is divided for convenience into two columns, one for soup and one for cocoa.

A list of housekeepers is made out at the beginning of the school year from the girls who have spare periods. There are usually four housekeepers during the morning, two for each period. One girl makes the soup, another the cocoa, and the second set of housekeepers finishes what the first has started. There are two waitresses every day to serve the soup, girls who usually bring their lunch, and each pair serves once a week.

The students come to the kitchen door for their orders. One waitress takes the order, checks off the name from the order list and receives the money. At the end of serving time she enters her receipts in an account book, in which are also entered all expenditures. The waitresses balance this book every day. The other waitress fills the orders.

The order list, the list of housekeepers, a sheet of careful directions to housekeepers and one to waitresses, are all posted on the bulletin board in the kitchen.

Vegetables and cocoa are purchased by the case. We have a special cupboard made in the kitchen for all supplies and dishes, so that the equipment of the department is not disturbed. Both the gas and coal range are used. The receipts are deposited in the savings bank, and all accounts paid by check by a student appointed for that purpose.

¹ School lunches are also carried out in a similar way in the High School of Galt, Ontario, Canada.

POPULAR EDUCATION IN DIETETICS.

WINIFRED STUART GIBBS.

A speaker at the Boston convention of the American Home Economics Association said, among other things, "A new work has always more of prophecy than fulfillment." The work of the "visiting dietitian" has not progressed far beyond the prophetic stage, but the step it has taken would seem to be decisive enough to command interest.

Conditions in the field have changed little since I made my report in the JOURNAL a year ago, but the fact that they still remain to be reckoned with, and give every promise of continuing so to do, is the best argument for those who wish to establish the work on a firm basis.

The decisive step onward of which mention has been made lies in the fact that interest among sociologists and domestic economists is spreading rapidly. From the beginning of the experiment there have been a few earnest persons who have been interested, but the year just gone has increased that number many times.

The New York Association for Improving the Condition of the Poor, the first of the large relief associations to add this form of instruction in its plan of work, is, of course, an exponent, so far as possible, of "constructive philanthropy," and it stands first of all for preserving absolutely the integrity of the home. In the opinion of the staff, no other one form of instruction is more intimately bound up with the foundation of things than that which attempts to solve the home side of the food problem.

In a general way, every student of nutrition knows that the results of improper feeding are very numerous, but one has to come into actual contact with the tenement home life to realize that they are practically endless. Broken down nerves with a consequent resort to stimulants, soft bones, weak muscles, faulty action of the organs of elimination resulting in diseases of the kidneys and liver, are a few of the direct results, but the indirect results, the friction in home life, the weakening of moral fiber, are no less formidable.

It is not to be expected that any one agent is permanently to reform conditions. We need all the combined wisdom of those interested, that the best plan may be at last perfected. The purpose of this paper is to trace further the development of the experiment being carried on by the visiting dietitian, or, as her pupils call her, "cookin' lady."

The effort is made constantly to make the work absolutely practical. Every resource of the individual family is considered, and then begins the task of so making use of their resources as to cause them to yield the best possible results in health and strength.

The work falls naturally into two divisions—those cases that approach the normal in income and health, and those which fall far below in either or both. Primarily the aim is to cope with conditions arising from ignorance rather than destitution, but the task of dealing with the subnormal cases would seem to be equally important, if education is to be given a chance to show all that it can do; for may not instruction in proper feeding so far restore the health of the destitute family as to give it an impetus strong enough to carry it out of the slough of despondency and dependence?

Here is a family of father, mother and four young children. The father has been a hack driver earning a more than comfortable income, until the constant exposure has weakened his constitution and a severe case of valvular heart trouble has incapacitated him for hard work. The diet has been most carefully prescribed by the dispensary physician, but the housekeeper has nothing but an easy going willingness to do the right thing on which to base her husband's hope of renewed health. Three lessons have given that woman a grasp of the subject sufficiently strong to enable her to cook each article of prescribed food perfectly, and the deadly attacks of indigestion are largely under control. The variety of teachings which it was possible to give in this case is of more than passing interest, for the arrival of the very newest baby complicated matters, and left a ten year old child at the helm during the mother's illness. The teacher found this child washing dishes with the help of her sister, the efforts of the latter being crowned with indifferent success; this fact was noted and apologized for by the "little mother" on the ground that "Helen is not so *very* old, you see." Helen had reached the advanced age of six years. The sequel to this story would be an account of the ten year old housekeeper's final triumph, for she learned to prepare the necessary food for her father and to make broth and gruel for her mother. This case

has been described somewhat at length, for it seemed to show equally well the advantage of the home plan of instruction by illustrating the close contact with vital matters possible to one who meets her pupils where they do their actual living.

One interesting case is that of a widow with six children. She was intelligent above the average, and with a mind keenly alive to grasp all the information that came her way. This mother had too much common sense to feed her children any food that was actively harmful and here it was a case of lessons in planning meals to make a better balanced ration and of lessons in cooking the food so as to make it more digestible. The pupil brought so much interest to the lessons that it was a very real pleasure to help her, and great was her pride and satisfaction when she learned how to make tough meat tender, how to cook vegetables, and in short how to give her hungry children food that was, however limited the variety, really attractive.

A woman worn and tired, with nine children to keep her busy, would seem at first not to give large promise as a pupil. However, the nine appetites were of such size as to make it necessary to do very close planning, and as the teacher arrived just after the man had been forced out on a sympathetic strike, she found ample scope for her energies in showing the woman that if fifteen cents were the only money at hand, it was possible to make it meet an emergency with an approach to adequacy if one learned the value of certain foods.

In one family a child with a bad case of skin disease gives the material to work on; in another a man with tuberculosis; one mother expects her daughter to throw off a state of nerve tire with the aid of a diet of strong tea and "buns" from the bakery; a Polish mother tells the visitor haltingly that she "knows only coarse cooking," but that her children like "American ways," so she begs to be taught.

A young housekeeper was given the opportunity of asking questions and she said: "I have just twenty-five cents to spend for supper; tell me how to make it go the farthest." That struck the key note. Most of them have only fifteen or twenty-five or forty cents as the case may be, but with all there is one point in common—the family living is done in a helter-skelter, hand to mouth way. Sometimes this is literally necessary, owing to the variable earning power of the bread winner, but a great advance for that family has been made when the housekeeper comes to realize the advantage of a systematic basis, and is taught how to run her house on such a basis whenever possible.

The American working man is apt to demand "the best," and one of the greatest services which can be rendered him is to teach his family that buying expensive food where cheaper would be equally nourishing is utter folly.

To those who are interested I would say this. In each family get the following information:

- a. Number in family.
- b. Income.
- c. Rent.
- d. State of health of each member.
- e. Habits in eating.

Then decide how much that family ought to spend for food, and teach them what food to buy and how to cook it.

As to the future, I should say: To make a success of work of this kind it is necessary occasionally to forget the vastness of the problem in the vastness of one's effort, to be willing to sow for the next generation to reap, and finally, not to be discouraged for lack of associates—several cities are interested, and others are falling into line; be ready to work in whichever corner your opportunity offers.

PROBLEMS IN NUTRITION.

Rubner, who has through many years of brilliant work made most important contributions to the theories of nutrition, has recently published two volumes¹ in which he considers questions of man's diet and the balance of matter and energy in nature. The review of these essays which follows was published in *Nature*.²

These two little books contain three useful and readable essays on those nutritional problems to which Prof. Max Rubner has directed most of his research work. The first of the above mentioned books contains two of these, and they treat of the minimum protein requirement of man and of the diet of the poor respectively. The first question has within recent years been brought prominently before the scientific world, as well as the public at large, by the work of Chittenden and others, who argue from their experiments that because they

¹ Volksernährungsfragen, pp. iv + 143, Leipzig, 1908, und Kraft und Stoff im Haushalte der Natur, pp. 181, Leipzig, 1909.

² *Nature* [London], 82 (1909) No. 2088, pp. 2-3.

themselves have been able for limited periods to maintain their health and equilibrium on an amount of protein which is far below the usually accepted Voit minimum, therefore all men should permanently reduce their intake of protein to the same low level. Those who believe that the minimum is also the optimum would do well to read and to consider carefully the Berlin professor's judicial commentary on their views.

What most strikes the reader is the extraordinary complexity of the problem. One factor, however, is absent, and that is the effect of work and rest, for this causes practically no effect on the metabolism of protein matter; but the question is sufficiently complex without this. There is between different people an enormous variation in what one may term their metabolic habits, so that any hard and fast rule is impossible. The mere body weight is not an important element, although, naturally, the heavier a man the more protein will he require. If this were all, it would be easy to adapt the dosage to the body weight; but the difference is deeper than this: to mention one point only, it is shown that, as a rule, the thin person requires more protein to maintain nitrogenous equilibrium than the corpulent. It must have been a matter of common observation that the stoutest people are not the biggest eaters. Another complicating factor is what one eats with the protein, and also the kind of protein one ingests. It is shown that on a potato diet, for example, the minimum necessary to maintain nitrogenous equilibrium is less than with any other of the diets adopted. We have further to take into account the presence in most foods of nitrogenous substances which are not protein, but which, nevertheless, have to be reckoned with.

The second essay, on the diet of the poor (agricultural labourers and the like), emphasizes very clearly one reason why a low protein intake brings the consumer dangerously near to the margin. It is shown beyond question that such a diet renders people much more prone to take infectious diseases, and there is a general lowering of the powers of resistance. Considering that the bulk of the population consists of those who are not well to do, this becomes a matter of national importance, and it is the duty of the State to interfere. Professor Rubner appears to think that legislative measures should be adopted. We can see, however, that the difficulty of legislating on such a matter is very great; but at least the people should be educated on the question of feeding rationally, especially where children are concerned. Anyone with any experience of hospital patients knows that ignorance, in addition to poverty, is at the bottom of most of the con-

ditions of malnutrition which meet us at every turn. Ignorance, moreover, is not confined to the poor in regard to this most important question.

The third essay, which occupies the second volume, is a summary of Professor Rubner's work on nutrition generally; it is written in a more popular manner than most of his publications, and a distinct philosophical vein runs through it. The chemical events which occur in the living body fall mainly into two categories—(1) those due to the activity of enzymes; in these there is but little transformation of energy; and (2) those which may roughly be described as combustion, and from which the energy of living and doing is derived. It is the second class of chemical changes to which Professor Rubner has mainly directed his attention, and it is to him, in particular, that we owe the experimental proof that the law of conservation of energy applies to the living cell as well as to the world of inorganic matter. The law of the conservation of energy is so universal that one might, perhaps, have assumed it would hold for living as well as for lifeless material. But the scientific mind assumes nothing without direct proof; we have no right to assume beforehand that some other law might not be found operating in the organic world. The crude calorimetric researches of Lavoisier and the early pioneers of this subject certainly showed great discrepancies between the results obtained and those calculated from the energy value of the diets employed; but as technique has improved so has it been shown that all such discrepancies were the result of imperfection in the methods used. For the improvements in method, and the patient working out of the problem, as well as the final demonstration of the truth of the great law of energy conservation in the world of life, there is no one to whom we owe more than to Professor Rubner himself.

EMMA HART WILLARD—A PIONEER IN THE HIGHER EDUCATION OF WOMEN.

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In the hope that it may be a source of encouragement and inspiration to all who are interested in the advancement of the education of woman, a review is given below of the work and ideals of Mrs. Emma Hart Willard, a most earnest and energetic pioneer in the cause of woman's education, and one of the first American teachers to recognize the possibilities of educational work in Home Economics. In preparing the article the writer has made free use of data brought together by others¹ who have been interested in the subject.

Miss Emma Hart was born February 23, 1787, in the Worthington Parish of Berlin, Conn. She received her early education in a district school, and later attended for two years the Berlin Academy. Being one of a large family, she early learned the value of true economy and how to help in the care of those around her. In the spring of 1804 she took charge of a children's school in the village of Berlin, and after a few years spent in alternate teaching and attending school, she took charge successively of the Berlin Academy, Westfield (Mass.) Academy, and Middlebury (Vt.) Academy, and while she encountered many hardships, her work met with brilliant success.

Of her early work in Middlebury, Mrs. Willard writes:

The winter of 1807-8 was one of exceeding hardship for me. Although the weather was very cold, with frequent storms and much snow, I had to walk from Dr. Tudor's where I boarded, to the academy and when there to keep my school in a large long room, formed like an ordinary ball room, occupying the whole upper story, while the only means of gaining warmth was from an open fire, in a small fireplace on the north end. Yet that winter I had an increased and very pleasant school. When it was so cold that we could live no longer, I called all my girls on to

¹ Samuel Swift's *History of the Town of Middlebury in the County of Addison, Vermont*. Middlebury: 1859, pp. 391-401; and an article entitled *Educational Services of Mrs. Emma Willard*, by Henry Fowler, in Henry Barnard's *American Journal of Education*, 6 (1859), pp. 125-168.

the floor, and arranged them two and two in a long row for a country dance; and while those who could sing would strike up some stirring tune, I with one of the girls for a partner, would lead down the dance, and soon have them all in rapid motion. After which we went to our school exercises again. The school had quite an increase in the spring from different parts of the state, and amounted to sixty. Among them, and from the village, was a remarkable band of young maidens, ranging from about twelve to fifteen. I remained in this school two years from the time I commenced.

At the age of 22 she married Dr. John Willard. Soon after the marriage Dr. Willard met with unexpected financial reverses, which determined Mrs. Willard, with his consent, to undertake again the teacher's profession, and in 1814 she opened a boarding school for girls at Middlebury. A year or two later she formed the design of effecting an important change in education by the introduction of a higher grade of schools for women than any heretofore known. The close proximity of her school to Middlebury College made apparent the great disparity between the educational facilities for the two sexes, and she began to write an address proposing a plan for improving education for woman, hoping thereby to influence legislators to correct this discrimination. The plan was completed in 1816; but she determined to increase her efficiency and personal influence as a teacher before soliciting the support of influential men to place the project before the legislature of Vermont or other states. Her school grew, having an attendance of seventy, and she spent from 10 to 12 hours a day in teaching, and upwards of 15 hours when preparing for examinations. She taught her pupils (1) to *understand* by explanation and illustration, (2) to *remember* by recitation, and (3) to *communicate*, by preparation for examinations. She constantly had under investigation some new subject which while studying she taught to a class of her best pupils; hence every new term some new study was introduced. This thorough teaching added rapidly to her reputation. She began a series of improvements in teaching geography, educational history, moral philosophy, and philosophy of the mind. The introduction of the study of higher mathematics she regarded as a leading epoch in the education for women. "She regards it", says one of those who have written of her work, "as having more than any one thing been the cause of that stronger intellectual power which American women have long shown in their ability to teach not only high subjects in the schools but to investigate new ones and to manage high schools as well as those for children."

Mrs. Willard was most desirous of having some of her pupils profit by the college instruction in certain courses, and pleaded with the

authorities of Middlebury College to grant the favor. She asked merely that they be allowed to be present as listeners, but even that privilege was denied them, and so Middlebury failed to take advantage of a historic opportunity. The Middlebury professors, however, attended her examinations though they did not think it a safe precedent that she should attend theirs.

In February, 1818, she submitted her plan for an institution for the higher education of women to Governor Clinton of the State of New York, who in his message to the legislature recommended legislative action in a cause heretofore wholly neglected. A legislative act was passed incorporating the school at Waterford, N. Y., and giving to young women's academies a share of the State literature fund. This was the first law passed with its sole object the improvement of the education of women, and is the same law which now enable academies for women in the State of New York to receive public money. In the spring of 1819 the school was removed from Middlebury to Waterford, together with all the teachers and some of the boarding pupils. A large house was rented for 2 years and the school was enlarged—in its number of teachers, in its scope, and in its expenses.

An account of Mrs. Willard's plan was published under the title *An Address to the Public, particularly to the Legislature of New York, Proposing a Plan for Improving Female Education.* It was introduced by a compact statement of the importance of a thorough education for women and an appeal to the legislature to found and endow a seminary for women. Then followed a declaration of the author's views concerning the different duties of men and women, and the consequent need of a different and distinct system of education for each sex. She discussed the defects of the existing method of women's education, the principles by which education should be regulated, the educational plan of a women's seminary, and the benefit which society should receive from such seminaries. Briefly, she advocated the selection of studies and employment peculiarly fitted to improve the faculties, or such as the pupil would most probably have occasion to practice in future life, rather than to fit young women for displaying to advantage the charms of youth and beauty. The plan recommended as essentials of a women's seminary (1) a commodious building and equipment, (2) a library, (3) a judicious board of trustees, (4) suitable instructions—moral and religious, literary, domestic, and ornamental, the importance of education in natural, mental, and moral philosophy to be forcibly pointed out. Mrs. Willard believed further that "house-

wifery might be greatly improved by being taught not only in practice but in theory. Why may it not be reduced to a system as well as other arts?" she writes.

Her views on woman's mission as a teacher were received by the public with surprise. This was before the beginning of the working out of her favorite problem that children's education is the business of women.

In 1820, a legislative bill granting \$2,000 to her project failed in the New York Assembly, and more serious still, the Regents of the University of New York decided that no part of the State literature fund could go to the school. In May, 1821, Mr. and Mrs. Willard accepted a proposition to remove the school to Troy, N. Y., a corporation agreeing to provide a building and a plot of ground. The plan was circulated in all parts of the Union and also in Europe, and was widely approved, quoted and published in leading journals. Its claims were advocated before the New York state legislature, but the plan for state aid was finally rejected in 1823. This was a severe trial to Mrs. Willard's faith. However, she continued her Troy Seminary as a school under corporation management.

A comparison of Mrs. Willard's plan with the many girls' schools as they exist today will show many things of interest.

Her first teachers at Troy, except for music, painting, and the languages, were taught personally by herself, and afterwards by those whom she instructed. "It would have cost thousands to have provided an equal number of educated men to teach the branches taught in the seminary." The great and extensive popularity which Mrs. Willard's teaching and school text books had attained, for she wrote a number of text books on different subjects which were very widely used, caused scholars to come in from every part of the Union and also from Canada and the West Indies, thus providing means for the maintenance of the institution. The fame and the influence of the school were promoted by private and public examinations of the school, the circulation of her "plan," and chiefly through the professional training of teachers and the great demand for their services. Mrs. Willard's plan to train teachers may be called the beginning of normal school work in the United States. Of this she writes:

In a late account of normal schools, made by Mr. Ormiston of Upper Canada' he says the first in the United States was founded in 1838, in Massachusetts. This was more than twenty years later than the time when I began specially to prepare pupils for teachers. In Middlebury, Elizabeth Sherrill and Katherine Batty were

trained to become teachers in the institution which I was proposing to found, and they were among my first teachers in this state.

After the school was established in Troy, encouraged by a very liberal and unexpected private patronage, but disappointed in the endowment expected from the state, Mrs. Willard writes:

I ceased applying to the legislature, and determined to spread in another manner what I believed an improved system. I then betook myself to the training of teachers. Young women of character and of talents I received to board and educate, some of them to clothe and some to pay traveling expenses; when afterwards they went forth, as recommended by me, on application for teachers, to our different states. They went pledged to pay me, when they earned sufficient money, by teaching; being, however, allowed to retain of their earnings sufficient to clothe themselves. In this way I continued to educate and send forth teachers, until 200 had gone from Troy Seminary before one was educated in any public normal school in the United States. Thus early was my system of female education carried to every part of the country, and the school, which in 1814 was begun in Middlebury, is fairly entitled to the honor of being the first normal school in the United States.

Mrs. Willard, it would seem fair to conclude, deserves the credit for starting the normal school movement which she claims.

Dr. Willard died in 1825 but Mrs. Willard continued to manage the Troy school until 1838, when she gave it over to her son. In 1830 she traveled in Europe, and later published a volume descriptive of her journey. The proceeds from the sale of this book she gave to a school for women in Athens, Greece, which she had helped to found. Besides this book and her text books she published a volume of poems—of which the best known is "Rocked in the Cradle of the Deep."

Mrs. Willard died in 1870. She was a great influence in the movement for higher education for women and has always been an inspiration to all who hold like high ideals. In 1895 a statue was unveiled in Troy in her honor to commemorate the work for higher education. An Emma Willard Scholarship has also been established in Middlebury College.

THE ECONOMICS OF THE FAMILY.

A Suggested Course for the Department of Home Economics.¹

GWENDOLYN STEWART.

The closing days of the year 1908 were marked by events of significance to those who are interested in the development of instruction in the welfare of the home and family. On December 28-30, the American Economics Association with its sister organizations, the Sociological Society, the Association for Labor Legislation and the American Statistical Society met in joint session to consider the condition of family life. In the city of Washington, on the day following the close of this session of unusual coöperation, the American Home Economics Association was organized for the purpose of "improvement of living conditions in the home, the institutional household and the community."² This evidence of the present effort toward the study of the family makes unnecessary a long introduction upon the importance of instruction in the economics of the family.

The study of the family in universities and colleges is of comparatively recent development. The growth of interest in and the recognition of the importance of such a subject may be said to be parallel with the beginning of the recognition of the importance of instruction in the principles of marriage and divorce. In the report of the National Divorce Reform League for the year ended December 31, 1893, it is stated that "the growth of interest in the study of the family and its incidental subjects and especially in sociology, of which former reports have spoken, was more marked in 1893 than in any former year, especially in the colleges for women."³

The study of the family began with promise in the women's colleges, but, apparently, these institutions have been loath to follow the trend of development in the extension and intensification of their courses.

¹ A portion of a thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts in Household Science in the Graduate School of the University of Illinois, 1909.

² *Jour. Home Econ.* (1909), No. 1, p. 1.

³ National Divorce Reform League, Rpt. 1893, p. 18.

As a class, the women's colleges have seemed reluctant to break away from the historical and ethnological development of the subject. They have felt justified in offering their students opportunity for intensive study in the misery of homes as provided in the courses in charities and corrections, but have feared to allow them the study of the wealth of homes as provided in a course in the economics of the family.

An examination of the latest catalogs of the leading universities and women's colleges and personal correspondence⁴ with the instructors in charge of the courses which include the study of conditions related to the family, seem to indicate that neither the family nor the home is yet studied as a normal institution: an organization, over which in a comparatively short time after graduation, the majority of the students, whatever their business in life, will have control.

It may, perhaps, be said that the universities and colleges have not fully grasped the significance of Mrs. Richards' appeal:—

"What is more needed is information as to what it costs to live well for a family with \$1500 to \$3000 per year. . . . It is because I believe in the possibility of control of even economic conditions by ideals firmly held by a sufficient number of fathers and mothers (who alone, according to Patten, count for much in race progress)⁵ that I urge so strongly the dissemination of what scientific knowledge we have."⁶

Dr. Ross, in his estimate of the discussions held during the joint meetings, previously mentioned, sums up with the statement:

All were impressed with the sovereignty of economic conditions over the structure of the family, and it was borne in upon all that the American family is in an unstable position and that changes are certain to come in the near future.⁷

The investigation of the economic conditions having an influence on the home should now be undertaken. The "spirit of getting behind"⁸ should be exemplified in the economic problems of the home. It may be remarked that among the leading papers of the last annual meeting of the American Sociological Society there were none on marriage and divorce. This fact is an indication that the present study of the family is an effort to leave the most obvious expressions

⁴ See pp. 229 to 232.

⁵ Patten, S. N.: *The Development of English Thought*. 1899, p. 385.

⁶ Richards, E. H.: *The Cost of Living as modified by Sanitary Science*. 2d. ed., 1903, pp. 76, 79.

⁷ Ross, E. A.: *Atlantic City Meetings. Charities and the Commons*, 21 (1909), No. 15, p. 665.

⁸ Devine, E. T.: *Results of the Pittsburgh survey. American Journal of Sociology*, 14 (1909), p. 660.

of conditions and to go behind to find the real causes which bring about the glaring ill-effects as well as the hopeful signs of family life. This movement may be considered as analogous with the development of the study of medicine and sanitation. The work was at first individualistic—the removing of individual evils—but now, it is a searching behind to find the causes, in order that not only an individual but that humanity may be relieved from possible distress. Professor Sedgwick has said, in contradiction to Alexander Pope:

“The proper study of mankind is the universe which include man.”⁹

“As has already been said, it is for those educated persons with \$1000 to \$3000 annual income to lead the way in the studies necessary to be undertaken before any authoritative statements can be made, and to show what the public ought to have; not always to cater to what the public likes.”¹⁰

Miss Salmon in taking up again the consideration of the problem of domestic service, emphatically states that practically nothing more can be done until the universities have undertaken the serious scientific investigation of the household problems.

If the household is to profit by the educational progress of the day, it can only be after the university has taken the initiative and has made all matters pertaining to the house and home a subject of scientific research.¹¹ It therefore remains for the university to recognize that the household is worthy of investigation.¹²

Pioneers in Home Economics in the early stages of its development did not undertake the economic study of the family or the home, but rather of the activities of the home. Now, students of Home Economics realize the importance of the principles of economics as applied to these activities and to the family as a whole.

The development of Home Economics itself was based on the fact that the maintenance of a well balanced home was hindered by the housewife's ignorance of her tools—the word tool being used in the sense of material as well as of equipment. In recognition of this fact, education began with the most obvious tools, those concerned with cooking, clothing, and cleaning. A campaign was inaugurated, not only by the schools but also by the public at large—the government, the manufacturer and the popular press.

The study of the early common school of this country shows that the first work began with the three primary subjects, designated with

⁹ Sedgwick, W. T.: Public lecture, University of Illinois, 1909.

¹⁰ Richards, E. H.: Loc. cit., p. 32.

¹¹ Salmon, L. M.: Progress in the household, 1906, p. 49.

¹² Loc. cit., p. 43.

never ending humor as the "three R's—readin', 'ritin' and' rithmetic." Home Economics, in its early beginning, included the three fundamental C's—cooking, clothing and cleaning. These three primary subjects have been expanded into the varied courses designated as economics of food; dietetics; household architecture; elementary home decoration; sanitation; and textiles. And, as the three original "R's" have been increased by a fourth, Mrs. Richards' "right living,"¹³ the moment is propitious for the fourth C in Home Economics, controlling.

A course on the economics of the family for the Department of Home Economics would be an attempt to consider the family from the standpoint of the woman, who through her position as administrator of the family funds, controls the status of the family in its economic and social relations. Such a course would be essentially a study of the family as it may be controlled by woman.

The fundamental concept of the course would be control in the home. The course would be not merely an attempt to impart information, but would also be an attempt to train the student to recognize and to value the economic essentials of the home, and to develop her ability to assume control and to administer the family expenditures according to economic principles.

In order that there may be a clear understanding as to the function of such a course it may be well to explain exactly what is meant, first, by the economics of the family; second, by the economic essentials of the home; and third, by economic principles.

Economics of the family is therefore the study of those relations which exist between the family and society in production, distribution and consumption of wealth. The true test of an institution is: Does it promote public welfare by the best methods and to the greatest extent possible? The object of the study of the economics of the family is to test whether or not the family, as an institution, promotes the public welfare by the best methods, and if not, to determine by what methods it may better promote the public welfare.

The economic essentials of the home may be said to be income, warmth, shelter, food, labor, markets, private property and social relations. Warmth, shelter and food are physical wants. They last through life. They are primary wants; they may be reduced, but cannot be abolished. Labor is an expenditure of energy in changing the form

¹³ Richards, E. H.: *The Art of Right Living*, 1904.

or condition of things. Labor is the active agent in all production. Properly directed labor adapts non-usable things to usefulness.

A market is a group of buyers and sellers in competition no matter where they are. The institution of private property, the exclusive control by a person over things of value, is the most important of fundamental institutions. One of the chief objects of economic study is to discover social relations and perfect them.

One of the problems of life is to adjust the essential activities to get maximum benefits, to economize on lower wants in order to have wealth for higher wants.

It is the present duty of the economist to insist upon this, to magnify the office of the wealth expender, to accompany her to the threshold of the home that he may point out, with untiring vigilance, its woful defects, its emptiness caused not so much by lack of income as by lack of knowledge of how to spend wisely.¹⁴

As a slight assumption of this duty to assist woman in her household expenditures, this suggested course in the economics of the family is submitted. The suggested course is planned for advanced students who have had a beginners' course in the underlying principles of economics. The plan of the course is similar to that used in the sciences. Recitations consume the minimum amount of time, the major work being done in the laboratory periods of investigation and collation of material in reports by the students.

An outline of topics with references, chiefly of recent date and of direct application to the subject, has been prepared as a suggested guide. The more important books have been starred in the selection of references. These are not only the best books on the topic indicated but in general they are the best books which are recommended for use under a number of topics.

The list of references is not by any means complete. This is particularly true of the topics which bear upon ethnology. In the selection of references the main idea of this course has been kept in mind, viz: that this course is one in economics, not in sociology, education or any other subject which may bear largely on the historical and ethonological basis of investigation.

It is necessary to include in a comprehensive study of the family, however, material from other subjects than that of economics. Therefore some of the essentials of education, economics, sociology, philosophy and physiology are introduced. These subjects have a definite

¹⁴ Devine, E. T.: *Economic Function of Women*, p. 58-59.

place in the study of the home and their direct application would tend to make clear their proportionate value.

It is important that the student should have a clear concept of the co-relation of each of these subjects to the home over which she may have control. In this course emphasis is placed on proportion in expenditure and on harmony of consumption with the idea of attaining the full spirit of contentment, harmony of surroundings and growth toward higher life.

Material on ethnology, marriage, divorce, and birthrates is abundant. There is also a wealth of material on economic principles, taxation, and the history of the early guilds and markets; but there is a decided dearth of material as applied to the problems in the economic life of the family and in the business organization of the home.

Many of the topics are considered first in theoretical relation. Ethics and economics are clearly related and, in the attempt to discuss many of these problems, ethics may be said to lead the way. After ethics the logical development is, as arranged by Professor Commons:

First statistics, the means of measuring the amount and the movement of social forces; next, economics, the analysis and valuation of the more compelling forces; then sociology, the coördinating and balancing of all the courses; then legislation, the control of the forces for social ends."¹⁵

The outline is based on the three fundamental problems in the economics of the family: the family itself; marriage; and the home; each in its economic and social aspect. The outline begins with the study of the family as an individual unit, including the relation of one part to another within the unit; and closes with the study of the family as a social unit in its relation to the economic world.

In studying the family the "first and most obvious material which presented itself for the study of the family was Ancient Law."¹⁶ But here the purport of this course has been kept in mind and an effort has been made to keep within the bounds of the subject.

The three primary constituent members of the family—the husband or father, the wife or mother, and the child, are each considered in their economic relation to one another. In the treatment of the "woman in the family" special emphasis is laid on the economic position of woman as wife and mother and as the administrator of the home.

¹⁵ Commons, J. R.: *The Atlantic City Meetings. Charities and the Commons*, 21 (1909), No. 15, p. 665.

¹⁶ Bosanquet, Helen: *The Family*, 1906, p. 9.

The discussion of the "child in the family" opens with an economic consideration of the birth-rate in its relation to the problem of population and to the family itself. In both cases, those influences which exist within the family are particularly noted. There is no attempt to apply pedagogical principles, but merely an effort to describe the child's economic rights and duties.

After this consideration of the family, as well as that of its status and economic function, marriage is taken up in the same general way. The discussion of the annulment of marriage and divorce follows that of the establishment of marriage. The problem of divorce is considered from the standpoint of its causes and of its influences upon the stability of the family.

In the discussion following marriage, the home is considered in its significance as a human institution. Its present relations to the economic and sociological forces of life are emphasized over those of the historical, artistic, and constructive. In the selection of material it is a little difficult to differentiate the principles which belong essentially to the home itself and not to the family or to some particular phase of family or home life.

The meaning of the word home is so peculiarly surrounded by ethical and psychic perceptions and impressions which enlarge and carry its meaning beyond the mere confines of any establishment, that even the discussion of home must be of such nature as to leave the mind open to the pressure of ideals rather than of ideas.

The establishment of the home as determined by location, dwelling and income is next discussed. Under this topic, the discussion of income is limited to the principles of economics.

The administration of the home, the most important topic of the course, considers the control of the income—its economic relation, as determined by the standard of life and the opportunities of expenditure, and its apportionment; first, to the essential factors of the home such as food, clothing, shelter, equipment, and higher life; and second, to the maintenance of the plant, which includes methods of administration, service and operating expenses. The course closes with a discussion of the ethical, economic and social relation between the home and the community.

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A SUGGESTED COURSE IN HOUSEHOLD ADMINISTRATION.

Such a course as the economics of the family could be offered in any college or it could be made part of a four years' course in household administration as here suggested.

The development of courses in business administration has opened the question whether or not similar courses can be developed in household administration. If the maintenance of a home is an industry which should be conducted upon a business basis, then the same arguments for a course in business administration for the business man may hold for a course in household administration for the home woman.

This suggested course in household administration is submitted as an illustration of what may be done in colleges having a department

of Home Economics, through the selection and arrangement of courses in the college of literature and arts and the department of Home Economics, during the four years of college work.

It is planned for students in the college of literature and arts who want a general education which will prepare them for the administration of the home in its domestic and social relations. The following discussion of the subjects of study has been adapted from a discussion of the courses in Business Administration.¹⁷

A home woman, conducting her home as a business, must know how to live with and coöperate with her fellow-men. She must know, in the second place, the materials handled in her business. This knowledge comes from scientific and technical study, and is secured through the department of household science, with its prerequisites in the departments of art and design, biology, and chemistry. She must know, too, the principles of business organization and their relation to the general industrial organization. This part of her training comes from the study of economics and sociology.

The course of study comprises, therefore, not only subjects which have a direct bearing upon the business organization of the home, but also those whose purpose is to broaden and liberalize the student's intellectual horizon and character. For general, as well as special reasons, the student of the home should study education, literature, philosophy and pure science. She should have some knowledge of history and political economy, and should have at least a general knowledge of such subjects as commercial law, contracts, money, banking and accounting.

The course therefore furnishes a liberal education, the subject matter of which deals mainly with present day problems connected directly or indirectly with the home. The "core of the course" is the work in economics—the principles of economics, a beginners' course in the underlying principles; the economics of the family; principles of accounting; and commercial law. The economics of the family, in addition to the discussion of the family, emphasizes the administrative side of the business of the home. It includes a study of the business methods and legal requirements of the home as a business organization and of the woman as a business manager.

¹⁷Courses in Business Administration, Univ. of Illinois Bull., 5 (1908), No. 36, pp. 6-7.

OUTLINE OF THE COURSE.

FIRST YEAR (ALL SUBJECTS PRESCRIBED).

First Semester (17 Hours).

Rhetoric-Themes (Rhetoric 1).¹⁸
 Free hand drawing (Art and Design 1).
 Home architecture and sanitation
 (Household Science 2).
 A foreign language.
 Physical training.
 Hygiene (Physiology 6).
 Introductory course: English Literature
 before the nineteenth century (English
 1).

Second Semester (15 Hours)

Rhetoric-themes (Rhetoric 1).
 Free hand drawing (Art and Design 1).
 A foreign language.
 Physical training.
 Introductory zoölogy (Zoölogy 10).

SECOND YEAR.

*First Semester.**Prescribed Subjects (18 Hours).*

Color problems (Architecture 41).
 Inorganic chemistry (Chemistry 1).
 Principles of economics (Economics 1).
 A foreign language or history.
 Textiles (Household Science 7).

Suggested Electives.

Bacteriology (Botany 5).
 Qualitative chemistry (Chemistry 3).
 Continental European history (His-
 tory 1).
 Ancient and medieval philosophy
 (Philosophy 3).

*Second Semester.**Prescribed Subjects (15 Hours).*

Economics of the family (Economics
 16).

A foreign language or history.
 Principles and selection of food (House-
 hold Science 1).
 Household art and clothing (House-
 hold Science 12).

Suggested Electives.

Inorganic chemistry (Chemistry 2).
 Qualitative chemistry (Chemistry 3).
 Continental European history (His-
 tory 1).
 Modern philosophy (Philosophy 4).

THIRD YEAR.

*First Semester.**Prescribed Subjects (14 Hours).*

Economic uses of food (Household
 Science 6).
 Minor course in physiology (Physiology
 4).
 Elementary psychology (Psychology
 1).
 General sociology (Sociology 1).

Suggested Electives.

English, a foreign language or history.
 A short history of architecture (Arch-
 itecture 29a).
 Agricultural analysis (Chemistry 13a).
 History of education (Education 2)
 required for Education 13.
 Medieval culture (History 8).
 College algebra (Mathematics 2) required
 for Mathematics 29.
 American federal government (Political
 Science 1).
 Introductory zoölogy (Zoölogy 10)
 Required for Zoölogy 2.

¹⁸ For a description of the courses referred to by number see Univ. of Illinois Circ.
 of Information of the College of Literature and Arts, 1908.

*Second Semester.**Prescribed Subjects (14 Hours).*

History of education (Education 2).¹⁹
 Dietetics (Household Science 5).
 Elementary home decoration (Household Science 3).
 Commercial law (law B).
 Genetic psychology (Psychology 5).

Suggested Electives.

English, a foreign language or history.
 A short history of architecture (Architecture 29a).
 Organic chemistry (Chemistry 9a, 9c).
 The Renaissance (History 9).
 Averages and the mathematics of investigation (Mathematics 29).
 Vertebrate and comparative zoölogy (Zoölogy 2) required for Zoölogy 3.

FOURTH YEAR.

*First Semester.**Prescribed Subjects (5 Hours).*

Principles of accounting (Accountancy 1).
 History of Home Economics (Household Science 13).
 Household management (Household Science 10).

Suggested Electives.

History and criticism of art (Architecture 29b).
 Sanitary analysis (Chemistry 10a).
 Educational classics (Education 13).
 Esthetics (Philosophy 8).
 Comparative and genetic sociology (Sociology 3).
 Vertebrate embryology (Zoölogy 3).

*Second Semester.**Prescribed Subjects (5 Hours).*

Principles of accounting (Accountancy 1).
 Seminar (Household Science 9).

Suggestive Electives.

History and criticism of art (Architecture 29b).
 Food analysis (Chemistry 5c).
 Social phases of education (Education 16).
 Ethical ideals (Philosophy 6).
 Physiological psychology (Psychology 9).
 Charities, corrections, and urban problems (Sociology 5).
 Vertebrate embryology (Zoölogy 3)

APPENDIX.

Personal correspondence with instructors in charge of courses including a discussion of the family in six women's colleges and in two of the universities is appended.

BRYN MAWR COLLEGE.

The only work here in Bryn Mawr College in the economics of the family as I understand your thesis subject, comes in my course in social institutions, a post-major (open only to students who have had twenty semester hours of economics and politics) course of two hours for two semesters.

In this course we spend considerable time in studying various sociological, anthropological and biological theories as to the origin of the family in the state and

¹⁹Instead of Education 2, Education 1 may be elected in the first semester of the fourth year.

in society in general: especially the economic function of women in the family and the status of women. Attention is paid to standards of living and the problem of the relation of wage rates to the family standards.

Certain problems of family economics are naturally discussed in some of the other courses: especially in connection with problems of consumption, but I think the only detailed studies are made in the advanced course.

Hoping that this to some degree answers your questions, I am,

Sincerely yours,

[Signed] MARION PARRIS.

Department of Economics and Politics, Bryn Mawr, Pennsylvania, March 15, 1909.

MOUNT HOLYOKE COLLEGE.

In reply to your letter of March 9, I would say that "the economic study of the private home" is not treated directly in our courses here. It is, however, considered indirectly in the discussion of women in industry in the course on the labor problem, in the treatment of the problem of child labor, the sweating system, and in the consideration of measures tending to maintain the standard of living of the laboring classes and looking to the elimination of poverty. These latter questions are considered in our courses in social economics.

Very truly yours,

[Signed] EMILIE J. HUTCHINSON.

Department of Economics and Sociology, South Hadley, Massachusetts, March 22, 1909.

See Bulletin of Mount Holyoke College, November, 1908, Series 2, No. 2, p. 42-43.

HARVARD UNIVERSITY.

My course on the distribution of wealth at Radcliffe is confined entirely to the study of the main shares in the distribution of the products of industry, namely, wages, rent, interest, and profits. I pay no attention in this course to what may be called the economics of the household or the distribution of family income among the various expenditures. In other words, I drop the subject as soon as the wealth has become income and do not follow it up beyond that point. Therefore, the whole question of the economics of expenditure is left out.

Very truly yours,

[Signed] T. N. CARVER.

Department of Economics, Cambridge, Massachusetts, March 10, 1909.

THE WOMAN'S COLLEGE OF BALTIMORE.

In course T2 I deal briefly by lecture with the economics of the family after treating the history of the family and its present status. I deal with the specialization of household industries and their removal from the home and the radical views of Prof. Patten and Mrs. Gilman and the replies of the conservatives.

Yours truly,

[Signed] THADDEUS P. THOMAS.

Baltimore, Md., March 3, 1909.

See The Woman's College of Baltimore Catalog for 1909, p. 57.

VASSAR COLLEGE.

Vassar College does nothing whatever along the lines you mention. The theory of the college is that its function is to give a general, not a specialized education, and that therefore it ought not to give special courses on the family, home, or household any more than it gives special courses on law or medicine. Under another cover I am sending you a catalog that will show you the general line of subjects taken up. I am sorry to have so meager a report.

Sincerely yours,

[Signed]

LUCY M. SALMON.

Department of History, Poughkeepsie, New York, March 3, 1909.

See Vassar College, Forty-fourth Annual Catalog, 1908-1909, pp. 46-48.

WELLESLEY COLLEGE.

In regard to your inquiry of March 9, Course IX is a course in general sociology and includes a consideration of the development of the family as a social institution.

The course in economics of consumption I am working out for the first time this year. The account given in the pamphlet *Courses of Study 1908-09* issued by the college fairly describes it, I think. The data you mention should certainly be included in the household consumption—especially should the common error be avoided of overlooking those forms of cost which do not appear in a money form—of which unpaid household labor is the chief specialty.

Yours sincerely,

[Signed]

EMILY G. BALCH.

Wellesley, Massachusetts, April 1, 1909.

See Wellesley College Calendar, 1908-1909, pp. 62-64.

UNIVERSITY OF CALIFORNIA.

As to the question you ask, the aims of our course in the household as an economic agent are distinctly what you suggest. The attempt is to make the study of the theory and practice of spending, and the sociological and ethical questions are only taken up as a background to the main points of the study. We aim to do field work in investigating ways of spending incomes of various sizes and the personal and social causes for such expenditure. The household is naturally the central fact of this study and its mechanism, its types, its development under different social conditions, naturally form the central interest throughout the course. In a few weeks I shall have prepared a brief outline of the work as I expect to carry it on next semester and I will send you a copy which may perhaps tell you more than this somewhat unsatisfactory statement can do.

Very sincerely yours,

[Signed]

JESSICA B. PEIXOTTO.

Department of Economics, Berkeley, Calif., May 19, 1909.

UNIVERSITY OF MISSOURI.

In my general course in Home Economics which I give to freshmen students, I use the Library of Home Economics put up by the American School of Home Economics as a text-book, and the class study particularly the first part of the volume on household management. Since I believe in making all the work as concrete as possible and in helping to form habits as well as to teach facts and principles, and since I cannot provide the students each with a family and a family income allowing them several years in spending it, I have the girls keep their own accounts, and hand in at the beginning of each month an estimate of the money that they will spend under various heads, and then at the end of the month I have them hand in their actual expenditures. Along with this I have discussed not only what is given in the book but a little of the economics of saving and particularly of spending, the law of diminishing utility, etc. Also we take up what is probably more sociological than economic, the discussion of the fact that the work that used to be done in the home by the women is largely done in factories, and hence the home maker is not the producer in the sense that she used to be, and we discuss some of Mrs. Gilman's ideas of the wife earning money outside of the home. It is all very elementary. I do not expect to do much more than to set the girls to thinking.

In a later course coming in the senior year in home administration, which will probably be given next year for the first time, I expect to take up these economic problems more thoroughly. I require a general course in economics (not Home Economics) as a prerequisite for this. I have not yet made out the course in detail and can hardly tell now what it will contain. If you are gathering information on this subject from many people, I should be glad to have an opportunity to get the results of your gleanings.

Very cordially yours.

{Signed} EDNA D. DAY.

Department of Home Economics, Columbia, Missouri, April 16, 1909.

SUMMER MEETINGS OF THE AMERICAN HOME ECONOMICS ASSOCIATION.

In accordance with the wish generally expressed at the recent convention of the American Home Economics Association, a summer meeting for all members interested in educational work will be held in connection with the annual convention of the National Education Association which meets in Boston, July 2 to 7, 1910. Plans are already being drawn for a program which will result in a discussion of some of the most important educational problems of the Home Economics movement, especially of certain matters which concern public education. The plan followed last year at the Denver convention of the National Education Association of organizing several sessions of the American Home Economics Association as an affiliated organization, will be followed this year. The Home Economics Association will provide its own program, but meeting places and announcements on the general program will be provided through the courtesy of the National Education Association.

Another summer meeting of the Home Economics Association is also announced. There will be a sectional conference, during the first week in June, of members of the Association interested in institutional management, at the Lake Placid Club, Lake Placid, New York. The program will raise questions which concern especially the household departments of educational and related institutions. At the Boston convention, the section meeting for institutional workers brought together sixty persons and there was expressed the need of occasional specialized conferences devoted to this field. Thanks to the cordial invitation of the Lake Placid Club it becomes possible at once to carry out this plan.

Further details of both summer meetings will soon be ready, and may be obtained from the Secretary. Programs will be published in the June number of the JOURNAL.

BENJAMIN R. ANDREWS,

Secretary.

525 West 120th Street, New York City.

EDITORIALS.

The question of the school lunch is a large one. In dealing with it we have to consider the relation of the lunch room to the school in which it is located; the industrial organization of the lunch room, including questions of the purchase of food, preparation, service, menus, etc.; the cost of maintenance and price of lunches, including relation of cost to teaching of domestic science in the school; and the benefits, direct and indirect, to pupils concerned in the maintenance of lunch rooms, including its educational value. And we have yet to deal with the question of the free lunch and all its relations to the much discussed undernutrition of the school child and to the conditions in the home from which the child comes.

All of these points are treated or at least touched upon in some of the dozen or more papers on the subject which we have gathered together in this number of the JOURNAL. They will be found very suggestive and will lead, we hope, to still more careful study of its various phases.

According to the careful statistics furnished by Miss Bryant of the Sage Foundation, it would seem an accepted fact in most European countries that the school child must be furnished a noon day meal whether he can afford to pay for it or not, while the tendency in our own country is to make the most searching investigation into the home conditions of the underfed child. We wish to call special attention as regards this point to the papers of Miss Gibbs and Miss White which report study and actual work among the poor in two of our large cities, their conclusions being very similar, namely, that in the great majority of cases the chief trouble lies not in the smallness of the family income but in the ignorance of how to spend it wisely, especially in the ignorance of food values and of the methods of cookery. Whatever may prove to be the proportion of such families among the poor, there is no doubt of their need for the visiting dietitian. Mr. Joseph Lee in a very thoughtful article, published in *The Survey* of December 4, holds thus:

The home and not the school is society's proper organ for providing physical support during childhood; that the providing of such support and the family observances that grow out of it are a matter vital to the home; and that whatever action society may take to insure the adequacy of such support should be carried out not through the school but through the home and in a way to preserve and foster, not to weaken it.

It is for this end more than any other that the Home Economics movement stands; for healthful and if possible beautiful surroundings in which the child may be reared; for such intelligent performance of enough of the household arts as will furnish the common meeting ground of parent and child, give means of expression and development, some training of hand and eye, some opportunity for mutual service, some contribution to the common life on which the love of home may grow. We are not disembodied spirits; we grow and develop and find expression only by touch on material things. This beneficent stream of household skill and care must be fed by as many new sources as we can divert to it.

One contributor takes a discouraged view of the situation. She says:

Little help is to be gained by visiting the parents of the children that are suffering from malnutrition. The poverty, ignorance and indifference that has caused the child's physical state cannot be done away with so easily. We have no authority to make the parent allow the child to eat at school even when the doctor has ordered it, no way to stop the spending of pennies for candy, and in the making out of menus their whims must rule us.

Directly bearing on this point comes the report of a very recent experiment in Boston which offers to the child a 10:30 a.m. penny lunch, a "snack" or "bite" to break the long hours between breakfast and the noon meal. This catches the pennies that have been going over the candy counter and freshens the child for the last hour of the morning session. And the report comes also that parents' associations are asking for talks and practical instruction. As used to be said in the New England Kitchen, the poor and ignorant woman *if she has a child* learns and develops and changes her ways even after thirty.

The attitude of patience and courage must be ours in working at this great problem.

We wish to call attention to the changes in address that will be found on the cover of the JOURNAL. All communications, including subscriptions and checks, should **The Journal's** New Address hereafter be sent to the Editor.

NEWS FROM INSTITUTIONS.

This year marks a change of administration and plans are well under way which will strengthen the work of each department and raise the standard of the college as a whole. The Home Economics department is receiving its full share of attention and a general effort is being made to strengthen and broaden the already strong course in domestic science and art. It is too early to announce the definite changes to be made, but the general policy is to raise the entrance requirements and to strengthen the scientific and technical work of the course.

The sentiment created in Kansas so long ago, largely as the result of the efforts of Mrs. Kedzie Jones, has developed into a state wide movement which is centered in the department at Manhattan. At present the department is offering three courses; the four year college course, the six months housekeepers' course, and the twenty weeks short course. Fully 90 per cent of all the girls who are graduated from the college graduate from the domestic science and art four years course. Their work is divided about equally between the fundamental sciences, the technical work, and the cultural studies. The degree of Bachelor of Science is given upon completion of this course. At present the enrollment is over four hundred. The housekeepers' course of six months given each year is, as its name implies, a course where special training is given for home making. The enrollment in this course for several years has been over one hundred. The twenty weeks short course is offered in two ten weeks terms during the summer. Its scope is somewhat limited because at present a knowledge of the sciences is not required for entrance. The students of this course are usually grade and high school teachers who recognize the need for such training, but do not have the time for a complete course.

Until the present year the members of the department have responded to frequent calls to visit farmers' institutes. This year the department has its regular institute worker and she has already visited over eighty farmers' institutes in the state. It is planned that during March, April and May she will conduct movable schools, and already there have been arranged a sufficient number of these schools to take the full three months. It is expected that much good will come from this effort, and that as a result the enrollment at the college will be still further increased.

Open house was held February 3 in the Domestic Science Exhibit, where in their new quarters Miss Haggart and her assistants received their friends.

Among the exhibits were fifty books for housekeepers, a typewritten copy of the list being given to visitors. On the walls were displayed the various samples of rugs, carpets, table and household linens and other materials used for the household art class in color and design; also the patterns drafted by the class and the completed garments.

Menu cards were shown of the four dinners which were planned, cooked and served by groups of two girls to six guests at different times this year. In the model kitchen were shown and explained all the modern devices used in the cooking and serving of different meals, while in another department were shown the various articles used in teaching the home nursing class. A delicious luncheon was served by the first preparatory girls.

BOOKS AND LITERATURE.

How to Feed Children: A Manual for Mothers, Nurses and Physicians. Louise E. Hogan. 9. Edition. Pp. 249. Philadelphia, Penn. J. B. Lippincott. Price \$1.00.

The ninth edition of Mrs. Hogan's book, newly revised, differs from the earlier ones chiefly in the addition of a chapter on School Luncheons, in which attention is called to the value of suitable control of the school lunch counter as a means of improving the nutritive conditions of school children. A brief description is given of the methods employed in the lunch rooms of the Philadelphia normal schools for girls, and in the Horace Mann School, New York City.

It is unfortunate that in the revision of a book which contains so many valuable practical hints to mothers, a number of scientific inaccuracies have still been allowed to remain. In the light of modern knowledge, it is especially deplorable that the chapter on "Inorganic Salts in Food" has not been thoroughly revised. The book will not commend itself to teachers because of these errors.

Greater emphasis on the use of milk in the diet of children *after* the first year and still less on pasteurization, especially for milk fed to babies, would seem desirable in a book intended for the general reader—Mary D. SWARTZ, PH.D.

The Baby:—A Book for Mothers and Nurses. Daniel Rollins Brown, M.D. Cloth, pp. 200. Whitcomb and Barrows, Publishers, Boston, Mass. \$1.00 net.

This book treats of the care of the infant in health, and prevention of disease. Infant feeding and other practical topics are included. It is a book for the home and is strongly recommended by competent critics.

Infant Depots in Sheffield. A. E. NAISH. *Jour. Roy. Inst. Pub. Health*, 17 (1909), No. 11, pp. 665-672.

An account of work at this institution, designed to aid in the care of infants and to lessen infant mortality.

Why American Marriages Fail, and Other Papers. Anna A. Rogers. Houghton, Mifflin Company. \$1.25 net.

This volume consists of various observations on contemporary life by an elderly woman of travel and social experience. Thus she believes that marriages fail because of woman's failure to realize that they are her work in the world, because of her growing individualism, and of her losing the art of giving, which has been replaced by a highly developed receptive faculty. American men are indifferent to everything except business, mothers are too emotional, coddling their babies and leaving their girls and boys to be neglected by schools that teach neither motherhood nor citizenship. We are too indifferent to custom house outrages and affronts to the flag, to the license of newspapers and the prudery of magazines and libraries; our streets and parks are badly kept, our public servants are impertinent; we are careless of

public health, law and order; our academic educators should be made practical and everything beyond grammar school fundamentals should be paid for.

As many of such suggestions as might fairly furnish a single pungent essay have been strewn loosely throughout two hundred pages.—CLYDE FURST.

How to Help. Conyington McMillan, New York, 1909. Price \$1.50.

This is a hand book primarily for charity workers, but useful to Home Economics teachers and to all who are taking a wider view of educational work as the organized means of carrying society forward into better things.

The book devotes six chapters to general principles treating of charity work, the charity organization movement, social workers, agencies for philanthropic work, and elementary principles. The second part of the work applies these principles to definite social groups who need help: The homeless man and woman; beggars and impostors; needy families as to finding work; intemperance; desertion; standard of living; widows with children; aged people; and consumptives. The third portion describes the organization of social and preventive work. The fourth part treats of fresh air work, home library clubs, boys' clubs, educational work; adults' clubs, and social settlement; and the concluding division treats of giving, indirect service, and some practical suggestions.

American National Red Cross Text Book on First Aid and Relief Columns. Major Charles Lynch. Philadelphia, Penn. 1908. Pp. 247, illustrations 74. Price \$1.00.

This contains instruction on how to prevent accidents and what to do for injuries and emergencies, and is useful as a reference book in the home. It is one of the most complete manuals published on the immediate care of the injured, and for elementary work in the First Aid.

Pressing with a Hot Iron as a Prophylactic Measure in Infectious Diseases. K. SVEHLA. *Arch. Hyg.*, 70 (1909), No. 4, pp. 373-379.

From a comparative study of the subject the author concludes that sprinkling material and pressing it with a hot iron is very effective as a means of disinfection.

Concerning the Disinfecting Action of Ordinary Tooth and Mouth Washes of Pathogenic Bacteria. R. Basseuge. *Deut. Med. Wchnschr.*, 35 (1909)

No. 33, pp. 1436, 1437; abs in *Chem. Abs.*, 3 (1909), No. 22, p. 2711.

The disinfecting action of a number of commercial mouth washes was tested on typhoid and cholera bacilli at both 15° and 35° C. With two exceptions the mouth washes studied showed no bactericidal action.

Antiputrescent Effects of Copper. A. Springer and A. Springer, Jr. *Jour. Indus. and Engin. Chem.*, 1 (1909), No. 9, pp. 676-678.

According to the authors' experiments, copper salts, even in the quantity of 1 part in 2,000,000, act as antiseptics to putrescent bacteria. Egg albumen, milk and other materials were used in the experiments.

Daily Menus for a Year at the Institute for Colored Youth, Cheyney, Pa., and A Dietary Study for the Month of October. Cheyney, Pa., 1909, pp. 48.

This bulletin contains an account of the work carried on at the Institute for Colored Youth (Teachers' Training School), at Cheyney, Pa., in applied domestic

science. This institution which is under the management of the Society of Friends, was founded in 1837 and reorganized in 1902, "to develop a normal school which will correlate academic and industrial education." It is stated that for three years the attempt has been made at the Institute to furnish the pupils with properly balanced and wholesome meals at low cost. The report includes the menus of the meals served during the school year 1907-8, together with the results of a dietary study which cover the month of October of this school year. It is stated that meat is served at all three meals, and tea for breakfast and supper, but no coffee. The selection of dishes is recorded as satisfactory, and the rations sufficient in quantity.

In estimating the cost of food, the expense for fresh table linen is included, as well as cost of fuel, service, and cooking. During the year 60 persons were provided for, and on an average the cost of food per person per day was 21 cents. The report states that the average waste was ten per cent of the food purchased.

According to the results of the dietary study the food as purchased cost 18 cents per person per day during the month included, while the food served supplied 89 gm. protein, 100 gm. fat, and 351 gm. carbohydrates per person per day, the total energy being 2758 calories. The daily menus were fairly varied, meats, fruit, vegetables, dairy products, bread and other cereal foods being used in the same combinations as are found on home tables. In the report of this investigation it is stated that all the pupils improved in health and working energy on the diet which the school supplies.

All of the pupils in the school assist in this applied domestic science work under the immediate direction of a graduate from the domestic science course. "The experiences of this effort have revolutionized the teaching of domestic science in this institute. The subject is now both practical and practicable, and we furnish our pupils skill as well as knowledge."

As a means of facilitating the work a system of keeping records has been devised for the store-room, kitchen and dining room, which the report states enable the school management by actual measurement to exercise "strictest economy in purchasing, preparing, cooking, serving and preserving the food materials." The schedules have been printed and like the report are for sale, the proceeds being devoted to helping on the school work.

Scientific Living or the New Domestic Science. Laura N. Brown. New York and London, 1909. Pp. XIV 284.

Some general principles of hygiene, physiology, and Home Economics are reiterated in this volume and a number of theories are advanced which though held by various health cults would not be generally accepted by the majority of well informed physiologists. The author apparently writes more or less from the standpoint of a follower of a non-meat diet, and such fantastic theories are advanced as a belief in the conservation of cell vitality by special methods of cookery in order that the alleged vitality may be taken up in some way by the body with its nourishment. The opinions and statements against the use of meat as a food which are usually found in such treatises are reiterated. Such volumes are of course appreciated at their real value by well-informed students of nutrition. In so far as it makes a plea for lessened labor in the household and more time for interests other than house work the volume is to be commended.

Ventilation for Dwellings, Rural Schools and Stables. F. H. King. Madison, Wisconsin, 1908, pp. 125. Price 75 cents.

This volume is a valuable contribution to a library of useful knowledge. It contains very readable and easily understood matter on a subject of growing interest and importance to every one. Such books may properly be classed as our most effective means of carrying on the war against tuberculosis and kindred diseases. The divisions of the book are three: (1) Introduction (pp. 1-44) on the necessity of ventilation both for human beings and for animals, and the evil results from the lack of it; (2) the principles of ventilation (pp. 54-75); and (3) the practice of ventilation (pp. 76-126). A large number of illustrations greatly add to the value of the book. It can be recommended for school and home use—JOHN F. WOODHULL.

The Practical Dry Cleaner, Scourer and Garment Dyer. William T. Braunt. Philadelphia, Penn. Henry C. Baird & Co. 3. edition, 1909. Pp. 330. Price \$2.50.

This book forms an important contribution to the literature of the professional cleaner, the housewife and the laundress, all of whom should know of the chemical agents to be employed, the method of removing spots, the characteristics of various dyes, and the treatment of different materials.

It is with this need in mind that the author has written a book which is valuable for its clear description of methods used, its recipes for various solutions for removing spots and its specific account of dyes and treatment of fabrics. The chapter on the removal of stains with the excellent tabulation as to fabrics and stains is so well written; the directions so complete, that it alone makes the book of great value. The student of textiles will find valuable material in the chapter on analysis of textile fabrics and to the student of dyes much information is given regarding proportions for various colors and shades. Cleaning, bleaching and dyeing different materials occupy the rest of the volume and while the descriptions are more or less technical they are of much value.

The author concludes his preface by stating that it has been his endeavor to introduce and describe clearly and in detail the most recent innovations, thus bringing the book up to date and rendering it useful as a reference and guide. Its contents demonstrate the fulfillment of this desire.—L. RAY BALDERSTON.

The Chemistry and Pharmacology of Insect Powder. J. Fujitani. *Arch. Expt. Path. u. Pharmacol.*, 61 (1909), No. 1, pp. 47-75, dgms. 8.

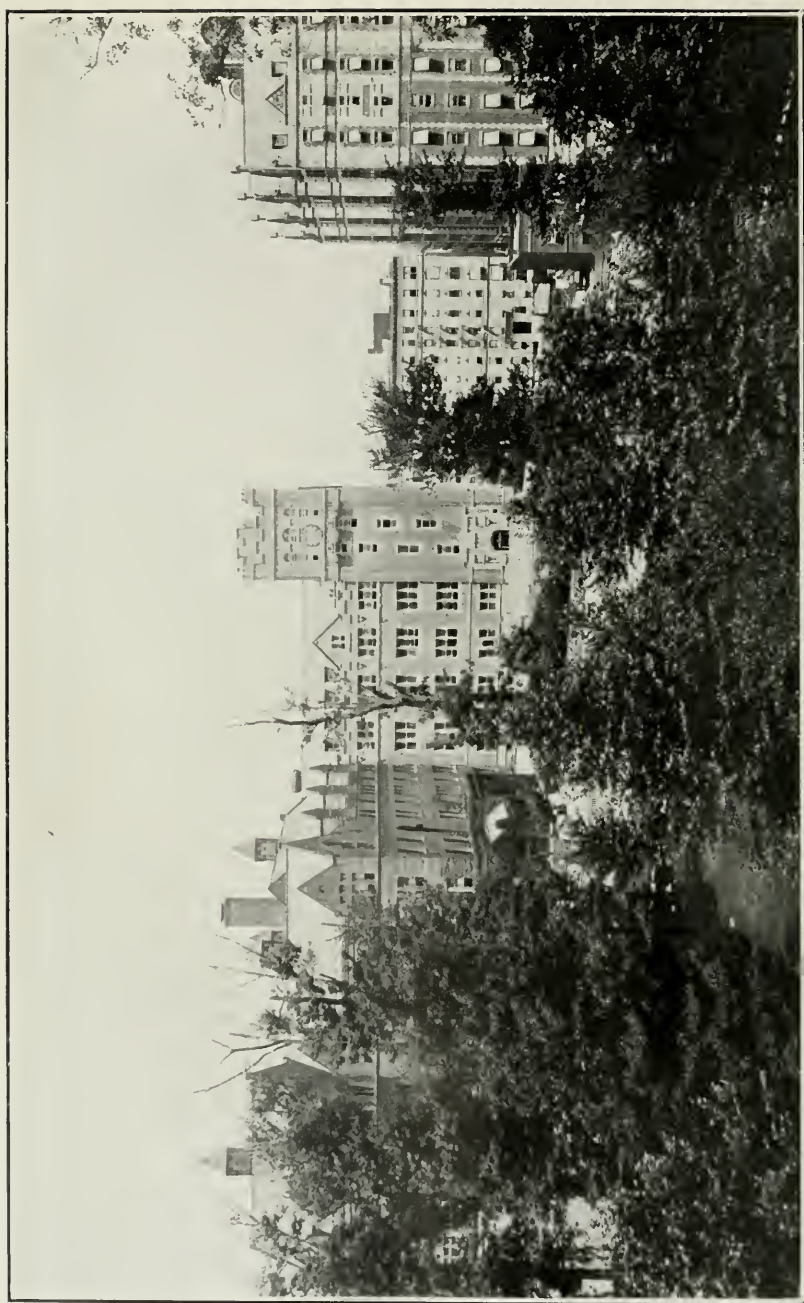
According to the author's conclusion the active principle of pyrethrum insect powder is pyrethron, an ester which yields pyethrol on saponification. The pharmacology of these substances was studied.

On the Method of the Italian Customs Service for the Determination of Sizing in Cotton. G. Tagliani. *Rev. Gen. Mat. Color.*, 13 (1909), pp. 221-223; abs. in *Chem. Abs.*, 3 (1909), No. 22, pp. 2755, 2756.

The official method is described and a modification proposed by the author.

Apparatus for Determining the Conductivities of Insulating Materials. W. D. A. Bost. *Cold Storage and Ice Assoc. Proc.*, 8 (1909), No. 2, pp. 89-123, figs. 34.

An illustrated description of the apparatus and methods employed in studying insulation problems with special reference to cold storage.



TEACHERS COLLEGE, COLUMBIA UNIVERSITY (SEE PAGE 306).

THE Journal of Home Economics

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No. 3

COLLEGE COURSES IN HOME ECONOMICS.¹

A. C. TRUE,

Director Office of Experiment Stations, United States Department of Agriculture.

Inasmuch as courses in Home Economics have been introduced into many of the agricultural colleges, the Association of American Agricultural Colleges and Experiment Stations has desired to have one of its standing committees, of which I happen to be a member, consider what should be included in such courses. The committee has therefore made somewhat of a study of this matter and I have looked into what these colleges are doing in different parts of the country. I have also considered the matter in the light of experience gained from studying college courses in agriculture and other subjects. In making such studies it has been my practice after a time to put my conclusions in the form of a tentative program and to set forth reasons for this program. I do this because it gives me a definite basis for further study and if I have an opportunity to present my scheme to others it affords something definite to discuss and criticise. I am glad therefore to have the opportunity to present this matter here and shall be only too glad to have my views frankly criticised, especially by those who are actually engaged in giving college courses in this subject.

The reaching of definite conclusions on this matter is obviously rendered more difficult because of the chaotic condition of the college curriculum in general. Many efforts have been made to establish

¹ Read at the Boston Meeting of the American Home Economics Association, January, 1910.

standard entrance requirements for colleges and it is generally supposed that great advance has been made in this matter by a substantial agreement on from 14 to 16 "units," representing an average four-year high school course, super-imposed on eight years in elementary grades. The great broadening of the high school curriculum in recent years, including the introduction of the so-called vocational subjects, has, however, brought in a factor which in the end is bound to affect radically the details of college entrance requirements.

It now looks as if in the end college entrance requirements must in some way be made to represent a certain amount of mental maturity and training rather than knowledge of particular subjects. Moreover, changes in pedagogical ideas are modifying our judgment as to the order in which different subjects should be taught. In my childhood everybody began with the alphabet when he learned to read. In my boyhood it was the universal practice to begin the study of Latin or Greek with the grammar. It used to be generally thought that the study of the ancient languages should precede that of the modern languages, but there are many now who insist that it should be vice-versa. In science it was long thought necessary to begin with more or less abstract elements and definitions and from these work up to the actual things. Nowadays many believe that the subject should first be presented in some concrete form and analyzed afterward.

On this theory the vocational subjects have a great advantage. The student's interest may easily be aroused in a steam engine, cooking, gardening, stock-judging, etc. Then he may be led to study the principles underlying these things.

From this it easily follows that it is not necessary to insist that the student shall have preliminary training in the fundamental sciences, e. g., chemistry, physics, or botany before he begins to make a systematic study of agriculture or Home Economics. By a careful selection of topics it is possible to give the student proper instruction in the simpler features of these subjects as a preliminary to their more scientific study. And this preliminary work may be the best preparation for the study of chemistry, physics or botany, because the student will naturally be interested in the sciences as subjects vitally connected with the real things of life.

Are we now prepared to take a further step and hold that it is not wise to insist that certain subjects, including agriculture and Home Economics, shall always be begun in the preparatory school?

When the college curriculum was narrow it was easy to insist that certain subjects should always be taken in the preparatory school. This idea was broken down when sciences and modern languages came to be regular high school studies. Colleges still admit students without either and give them beginning courses in colleges. Many scientific college professors indeed prefer that no science be taught in high school. Classical teachers will ultimately have to let students begin Greek or Latin in college. Teachers of vocational subjects may have to do the same thing and shop work, sewing, cooking, farm practice, etc., may be taught in college.

The college course then will differ from the secondary course not in the fact that the subject is begun in the former and continued in the latter, but rather in the adaptation of the college course to the greater maturity and broader general knowledge of the college student. If the subject, whether Latin, physics, agriculture or Home Economics, has been studied in the high school, that student should not be required to begin at the beginning in the college. But if he has not had the subject at all in the high school he should not be deprived of the opportunity to begin it in the college. And if it is a vocational subject, he should not be deprived of the opportunity to get the practice of the art in college because he has not had it in the high school.

This means that at least two courses in each vocational subject should be offered the freshman—a beginning course or an advanced course.

To these reasons may be added a prudential one. At the present time such subjects as agriculture and Home Economics are taught in relatively few high schools and the number of college students pursuing them is small. It is well therefore for the college to encourage more students to take such courses by meeting their actual needs for beginning courses.

By this I do not mean that the college shall give high school courses in these subjects. The college class in cooking or sewing or gardening should cover more ground and do things more thoroughly and intelligently than a high school class and the way should more distinctly be prepared for the scientific training which is to follow, just as a freshman class beginning physics or chemistry should in the same time do more and better work than a high school class in the same subject. Certainly in many of the states it would be unwise to insist now that only advanced courses in Home Economics are to be given in the colleges.

Obviously it is absurd for a college to send out graduates in Home Economics who cannot cook a meal or make a dress, or in agriculture who cannot milk a cow or run a plow. This is just as absurd as for the college to turn out graduates in Home Economics who know nothing but cooking and sewing or in agriculture who know nothing but ordinary farm practice. What kind of musical instruction would that be which did not include practice on any musical instrument, or art education which included no practice in drawing, painting or sculpture? Vocational education will not amount to much pedagogically or practically if we minimize the importance of good practice and overestimate the advantages of good theoretical training. The doing and the knowing should go hand in hand all the time and never be divorced.

It is the complex character of such subjects as Home Economics and agriculture that gives them their very high pedagogical character when properly taught.

Instruction in the Latin language had its highest pedagogical value when there was combined methodical and scientific grammatical drill, both analytical and synthetical; translation both ways in large amounts and variety; acquisition of knowledge of the ancient ideas that they might be applied to the life of the times; and the acquisition of a language which was yet the living tongue of the law courts, the churches and all international communications. Only a remnant of such pedagogical value remains in Latin as ordinarily taught in our schools today. We shall never again have such classical scholars as Milton and Macauley. The impulse and the necessity for such kind of learning have departed forever.

The important question is—Can we transfer to the sciences and the vocations the thorough mental discipline and broad practical training once conveyed to a few select minds through the ancient classics and make these newer studies the media for the best mental development of great masses of students? The great problem of the modern college is to make genuine and thorough scholars in whatever subject is pursued, and above all in those subjects which come closest to the actual life of modern men and women.

To do this in Home Economics or in agriculture it is necessary to consider the subject in its broad relations both to science and to practice. There should be careful and methodical training in details of practice, keen and accurate analysis and synthesis on the basis of scientific knowledge of the whys and wherefores, the use of knowledge

(as acquired) in varied combinations for practical ends, and the pursuit of new knowledge which may be applied to the improvement of the art and the welfare of mankind. It is these principles which are to be worked out in college courses in Home Economics, and it is this broad scope and purpose which should distinguish them from the narrow routine of the more elementary work in the lower schools.

To construct courses on this basis it seems fair to claim that in some way every graduate from a college course in Home Economics should have a fair working knowledge of the household arts, and that if she can not get this in the secondary school, she be allowed to get it in the college.

To illustrate my present view of this matter I have drawn up the following outline of two college courses in Home Economics, based on those given in two American colleges:

(Both to be offered in the same college.)

MINOR COURSE.

- | | |
|---|-------------------------------|
| (1) Plain sewing and garment making. | |
| (2) Cooking. | |
| (3) Selection and preparation of foods. | |
| (4) Economic uses of foods. | |
| (5) Home architecture and sanitation. | |
| (6) Textiles. | |
| (7) Home decoration. | |
| (8) Household management. | |
| (9) Advanced cooking | } At least one of this group. |
| Dressmaking and millinery | |
| Art needlework | |
| (10) Food and nutrition | } At least one of this group. |
| Dietetics | |
| Household art | |

MAJOR COURSE.

(1) and (2) to be taken in preparatory school and credit given in college entrance requirements.

Required Studies.—(3), (4), (5), (6), (7), (8), (9) (one of group), (10) (one of group).

Electives.—At least one additional course from 9 or 10 or from other electives in Home Economics offered in the college.

COLLEGE COURSES IN ECONOMICS APPLIED TO THE SCHOOL OF HOUSEHOLD ECONOMICS.¹

SUSAN M. KINGSBURY, Ph.D.,

Simmons College.

The question of Household Economics deals not only with the scientific but also with the economic things of household life. It includes the study of the most economical way in which the household may be conducted, but in addition concerns itself vitally with the processes of manufacture, of production and of distribution of those articles which are to be consumed in the home. The escape of the processes of production from the home has forced women to seek a knowledge of the quality and cost of production of those articles which were formerly manufactured in the home and which are now made in shops and in factories, or in larger quantities within the home, with the idea of distribution to other places in exchange for goods.

In Simmons College during the past year or two we have attempted to give some special line of work to individual students which would cover a part of this field, but I have failed to discover that any form in which such work might be presented as a specific college course has been developed. However, this year we have introduced the plan of having the seniors devote one-fifth or two-fifths of their time to some special study, as an elective, which shall give training in the investigations of subjects closely related to the scientific work of the student. Such work follows the economics of consumption, of production, and of distribution, considering these terms as applied to those matters which deal with the household and not in their application to the general field of manufacture and commerce.

In time these fields might be divided into specific courses and offered as electives or given as required work. Permit me to suggest, tentatively, five groups which are possible.

(1) *Municipal housekeeping*.—This subject should consider the laws of the state which regulate the conditions of the home or the city

¹Read at the Boston Meeting of the American Home Economics Association.

and of food supplies. It would thus require a study from the historical point of view of the growth of legislation along these lines and the development of the scientific side of municipal housekeeping, together with a training in ability to discover comparative costs and efficiency of such service—that is, training in statistical and economic research.

(2) *Independent business enterprise.*—The production and sale of food supplies and of clothing offers another field for intensive training. Investigation should develop executive or administrative power which would be of the highest value, building as it would do upon the scientific training gained in the earlier years of the course. This study should follow the line of the regulations imposed by law upon such production and distribution and the experience of those who have carried on such enterprises, thus reaching out for the best methods and the most economical means, and studying the markets for buying and for selling.

(3) *Production in the home of foods or of art materials, including the making of articles from textiles and the manufacturing of food supplies.*—Intensive study should inquire into the methods of disposal of the product, of means of securing raw materials and the actual cost of production in comparison with the price for selling. As an illustration, at this moment the question of the making of bread is under discussion and requires investigation of bake shops on the one hand and experimentation in manufacture in the home, on the other, to discover whether the manufacture of bread either for home consumption or in the home for distribution outside of the home is more or less economical than securing bread from public bake shops. This must also include the study of the comparative nutritive values.

(4.) *Household furnishing.*—Much has been done in the study of the sources of supply and of the methods of manufacture of household furnishings by the manufacturer, but little is known of the comparative wearing values of household supplies and the most economical methods of renovating household furnishings. The ability to supply the public with artistic furnishings and those which will be durable at a cost which is possible to the individual of moderate income, is at present before the American people largely in connection with the study of the tariff question. Such a study should include here as elsewhere an investigation of the opportunities for independent work by women in interior decoration and furnishing.

(5) *Domestic service.*—One of the most serious problems before

the modern housekeeper is the question of service in the home. The development of production outside of the home, from the point of view of economy, has tended to leave the unskilled processes to the woman in the home. Thus if it is true that the manufacture of bread outside of the home is more economical than in the home, or that the manufacture of clothing in shops is more economical than in the home, the American woman cannot afford to carry on such production in the home. Knowledge on her part of how to secure service which shall afford to her an adequate return for her outlay in wages is therefore necessary. This is tied up as are most of these other subjects with the understanding of the work of the people.

At present the five senior students in Simmon's College who are carrying on investigations are working upon the following subjects:

(1) The production of bread, one from the economic and one from the scientific point of view; (2) the opportunities for women in interior furnishing together with the methods of conducting such a business; (3) a survey of the methods and results of serving school lunches in the public schools of Massachusetts; and (4) the laws regulating employment agencies, the best methods of conducting such agencies, and the general question of domestic service.

In conducting these studies three considerations are kept in mind. (1) Whatever work is done shall connect itself closely with the technical and scientific work of the department of Household Economics. (2) It shall give to the student training which looks toward immediate professional occupation. (3) It shall contribute to our knowledge of the opportunity for women in these lines, and shall thus aid the college in understanding the opportunities for training which may be offered; or it shall contribute to the acquisition of knowledge which is desired for the conducting of the work in the school of Household Economics; or it shall contribute to a knowledge of situations which shall be of practical value in connection with legislation and administration in our commonwealth.

This is but a beginning of what we hope will grow into a series of original studies in seminars, each devoted to some one important subject. Out of these should develop some fundamental courses, to be given to all students in the Household Economics School.

THE RELATION OF PHYSICS TO HOME ECONOMICS COURSES.¹

CHARLES L. NORTON,

Massachusetts Institute of Technology.

[*Introduction by Mrs. Richards.*—Some of us who are engaged in chemistry believe that chemistry is the foundation of everything, but the physicists believe that they have the foundation. Now, we know the most important thing is the application of heat. If you remember one of the earliest investigations which Mrs. Abel and I undertook under the Elizabeth Thompson foundation and under a foundation to which Mr. Carnegie and Mr. Phipps contributed, our report to the American Association in 1890 was entitled the Application of Heat to Food Materials, and at that time we had very little to go upon. There was very little in the literature, very little experimentation on the effect of heat in its various applications to food. Mr. Atkinson, as you know, suggested that we were most wasteful of fuel in our kitchen stoves and he tried to utilize the light of the lamp for the cooking of the breakfast. It was a truly scientific instrument, but woman was not equal to a scientific instrument and the Aladdin Oven failed in its purpose. The Aladdin Oven was originally evolved from the Norwegian cooking box, and its modern representative is the fireless cooker. The fireless cooker has certain merits; and the Aladdin Oven had many merits which are not appreciated today, though naturally it had some demerits. Now in ordinary climates we are obliged to use fuel, and we all find fuel very expensive. In very many ways the applications of the scientific problems of heat are becoming more and more important to us; and we have great pleasure today in having with us Professor Norton, who worked with Mr. Atkinson. He has many very interesting things to tell us and will, I am sure, give us a great many props on which we can build our future work.]

¹ Read at the Boston Meeting of the American Home Economics Association January, 1910.

Before discussing the relation of physics to Home Economics or to instruction in that subject, it is perhaps well to call to mind just what we ordinarily mean by the term physics. Our senses bear evidence of the existence about us of numerous bodies which have various properties in common, such as weight, density and elasticity, and these properties we attribute to the matter which these bodies contain. We believe this matter to be an inert thing and the mutual motions and effects of the bodies we believe to be due to an active agent or force, which we call energy, and stated in its simplest terms, physics is that branch of science which deals with matter and energy. Putting it this way, there seems some justification for the comment of a student, who said he judged physics to be "the science of everything and what happened to it." The term energy is somewhat difficult to define with precision but Holman's definition that "energy is anything which can produce or change the rate of motion in a body," will indicate to you at least what sort of a thing energy is. It is familiar to us all as the means supplied to us by the sun, by fuels or by bodies of water in an elevated position and which are used as sources of power in many operations of commerce and in the arts.

So long as we concern ourselves with the substances or bodies about us and their mutual changes and position, color, density or elasticity, etc., we are working in the realm of physics. On the other hand, if we seek to determine the composition of the matter of which bodies are composed, or to effect the decomposition or recombination of the separate substances, we come into the domain of chemistry. Of late there is a growing tendency to set off from physics such portions of that science as are concerned with large quantities of matter or with the transformation of large quantities of energy. This branch of physics deals with larger machines, heavier apparatus and oftentimes, commercially important problems and is usually classed as engineering. It is not possible to draw a sharp line of division between physics and chemistry and in fact we are today building up a great branch of science known as physical chemistry, and another known as chemical engineering, and it is not possible either to draw any sharp line of demarcation between the physics of electricity and electrical engineering.

The common subdivision of physics usually found in courses of instruction in our schools and colleges separates the subject into five topics: Mechanics, light, sound, electricity and heat. Beginning with the one which has the least direct bearing on the subject of Home

Economics, we should come first to the subject of sound or acoustics. I think were it not for our universal love of music and for the tremendous utility of the telephone, the study of acoustics as applied to Home Economics and to other kindred practical subjects would be considered of even less importance than appears to be the case today; yet it ought not to be neglected. The sound-proofing of our dwellings and the provision of satisfactory acoustic properties for our places of meeting as well as the prevention of noise in our cities, all call attention of the importance of further study of this branch of physics.

Under the subject of light we have many household problems, but the fact which confronts us most clearly is the very great increase in efficiency of the work done by an ordinary operative in the mill or a worker in the household when provided with adequate and proper light. Aside from the matter of efficiency and speed in working is the question of the comfort and well-being of the worker.

The development of the lighting of our dwellings has been steady and rapid from the time when the window openings were closed with semi-transparent membranes of paper through the days of clear glass to the present, when we may by the use of diffusing glasses or prisms redistribute the light in our houses almost at will. The proper distribution of light throughout our rooms either in dwellings, school-houses or mills by means of diffusing glass in the windows or properly located artificial lights with ceilings and walls of proper tint and texture is a subject which may well have the attention of every student in Home Economics. The development from oil lamp to gas burner and to electric lamp of carbon or later of tungsten has been tremendously rapid and has given us agents for home economy of which our grandfathers never dreamed.

The relation of electricity to household economy is so close and is changing so rapidly that it is impossible in the time at my disposal to more than suggest its nature. The certainty of supplying energy, be it heat or mechanical energy, or of furnishing light or other active agents by electrical means at exactly the desired rate for the best and most economical length of time and with the minimum of discomfort, noise, dirt, and so on, has led to its rapidly increasing use. It is unnecessary to more than suggest what a useful agent this is becoming in lighting, cooking, sterilizing, cleaning, etc., to make apparent the importance of its bearing upon our everyday means and methods of living. It is utterly impossible to predict how nearly universal its use is to become in the near future.

The fourth subdivision of physics, called mechanics, is perhaps an older branch of the science and deals more with those things which have become the chief concern of the mechanic or workman on the one hand and of the mechanical engineer on the other. However, a proper understanding of the principles of mechanics is necessary for the consideration of the other branches of physics. The increasing use of new materials for buildings leads to a discussion of their physical properties and the mechanical properties especially need much attention for the determination of their fitness in the construction of our dwellings. I might instance the substance, concrete, which is becoming a very live factor in our modern construction, and to my mind, a very desirable one.

But it is to the fifth division of physics, namely, heat, to which I should ascribe the greatest importance in its bearing upon the subject of Home Economics, and I wish to quote to you what one of the foremost writers upon general physics has said upon the subject of heat.

There is, perhaps, no scientific inquiry more full of human interest, than the study of the nature of heat, and the manner in which matter in general is affected by it. No branch of physical science is so intimately connected with the everyday occupations of life, and, consequently, none of them interests mankind more closely.

The influence of heat is manifestly so universal, and its actions so important and necessary to the progress of all the operations of nature, that, to those who first considered it with some attention, it must have at once appeared to be the general principle of all life and activity on this globe. With its return in springtime the bud breaks into blossom, and new life animates the vegetable kingdom. By its agency the incubation of the egg progresses, a living thing is brought into the world, and heat is still necessary to its support. Finally, to the power which man has acquired over it is due that supernatural strength which has made him superior to all other animals, and master of land and sea.

We live in very narrow limits of temperature and while the known range of temperature is from -400° to nearly $+4000^{\circ}$ (Fahrenheit), we cannot ourselves withstand variations in temperature greater than about 150° F. and then for only a short time. The variation in temperature of our own bodies, amounting to only a very few degrees, results in the cessation of life. The study of heat and temperature and the means of their control would seem therefore to form an important part in courses relating to instructions in methods of living. Perhaps I might point out to advantage two phases of our domestic economy where our ignorance or neglect concerning matters of heat causes great economic loss. In the matter of cooking we are confronted directly with the problems of heat, usually the acquiring and main-

taining of a proper temperature over a relatively short period of time. We wish, for instance, to heat a limited amount of food up to a certain temperature, say 200° , and keep it there for an hour or two. Ordinarily we do this in a monstrous thing known as a cooking stove made of cast iron, and if the examples with which I have had personal experience are typical, they are well calculated to heat our kitchens and to send much heat up the chimney, but are singularly inefficient in the matter of making use of the energy in coal for cooking. My own cooking stove is capable of using up coal enough to supply 700,000 British thermal units in one day. I am unable to state after long experimenting just what percentage of the heat can be utilized in cooking but something like 0.1 per cent is the probable amount.

It was a realization of this sort of thing that led my very good friend, Edward Atkinson, to spend much time and energy upon his Aladdin Oven. The fireless cookers which have followed it are not open to criticism on the ground of efficiency in utilizing heat but are somewhat limited because of the restricted temperature range in which they operate. I look for an electrically heated jacketed oven in which by supplying electricity we may heat our food at exactly the desired temperature over a very wide range for any desired length of time with absolute certainty that no sensible portion of the heat is lost. In some of the present cooking devices there is enough heat supplied in baking a loaf of bread to keep that loaf of bread hot for three months could the heat be wholly concentrated upon the bread and the pan in which it was cooked.

The second of the points which I desire to raise in connection with heat in our Home Economics work relates to the construction of our buildings as regards their warmth and their ability to withstand fire. The first consideration becomes a discussion of the physical properties of the materials of building, first as concerns their insulating value or non-conducting properties, and second their rates of expansion and contraction and hence their liability to produce cracks or fissures with changes in temperature. We give to the fire resistance of our dwellings, both as a subject of instruction and of daily concern, altogether too little attention. It is a matter of the greatest reproach to the community at large that it allows in this country an annual fire loss so great that when it is added to the excess cost of our water departments necessary because of the fire danger and to the cost of our fire departments themselves it presents a total of something like \$300,000,000 annually. This great loss and its probable increase from

time to time by great conflagrations becomes a grave source of danger. It is not a matter of insurance, since the real economic loss is here whether there be insurance or not. It may sometime become, as Mr. Atkinson believed, a matter of insurance engineering, but at present I believe it is a matter of study, first, of the physical properties of materials, and second, of the proper administration of our households, mills and schools.

In teaching the subject of physics I have become thoroughly impressed with the belief that instruction by means of experimental lectures accompanied by laboratory work is much the most efficient system. For the same expenditure of time I think this sort of instruction yields better returns than the recitations, even though these be accompanied by some laboratory instruction. I have had opportunity during the last few years to note the effect upon students, when in larger or smaller laboratory sections, of various courses of engineering resulting from the instruction given them in heat, and I believe the efficiency of the instruction where sections in the laboratory can be kept down to 10 or 12 men is enormously better than when those sections are two or three times as large. I realize that much has been written and said on this subject but I cannot forego the opportunity to express my strong conviction that laboratory instruction in physics is relatively singularly effective when taught to students in small groups.

Perhaps a word as to the cultural value of physics might not be out of place here. It has not always been customary to class such sciences as physics and chemistry as subjects which make for a general cultural development of the student, but it seems to me more and more apparent that physics properly taught, with care to avoid details and to concern one's self with the principles and phenomena of heat, light, sound, mechanics and electricity, has very great value as a cultural subject.

THE RELATION BETWEEN COLLEGE AND UNIVERSITY DEPARTMENTS OF HOME ECONOMICS AND THE OUTSIDE COMMUNITY.¹

WILLIAM D. HURD,

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A discussion of the relation of departments of Home Economics in colleges and universities to outside communities opens up for consideration the whole topic of extension teaching. If I were to search for some time for an opinion of a high authority on which to base the central thought of this paper, I probably could not find more applicable material than that contained in a recent address by President Lowell. He is quoted as saying last week:

A university, to be of any great value, must grow out of the community in which it lives, and must be in absolute touch with the community, doing all the good it can and doing what the community needs. Any institution which is not in absolutely close touch with the community about it, which attempts to be exotic, which attempts to live in the air without contact with the ground, is doomed to wither and die.

The institutions about us today that are doing the most in the way of helping their respective communities, are the great state universities of the middle west and we have an enormous amount to learn from them. We have to learn to do those things which they are doing, and we all realize how much more difficult it is to do that in the midst of an urban population with diversified industries than it is in a rural community with agriculture as the principal industry. It is as easy as can be to entertain the public. It is an extremely difficult thing to instruct it.

Again, the gist of Ex-President Eliot's speech at the inauguration of President Nichols of Dartmouth a short time ago, was a strong plea for vocational education. He said, not to quote exactly, that our subjects taught, our courses of study, our methods today, were all the methods of four hundred years ago, and that it was time to break away from tradition and change our educational system into one suited to the needs of the twentieth century.

¹ Read at the Boston Meeting of the American Home Economics Association, January, 1910.

And again, if I were to think long and work hard in an effort to describe what is meant by real, true, dignified extension work, I could not begin to picture it as well as it is already portrayed in an old, but nevertheless valuable, book treating this subject. To quote several passages taken somewhat at random, we find the purposes of extension teaching set forth as follows:

It has a message for men and women alike; for the educated as well as for the uneducated; for the rich no less than for the poor. It seems likely to prove one of the great organizing and initiating forces so necessary and as yet unfortunately so rare in the educational and social life of the United States.

University extension is a widening of the doors of the college and university so as to take in classes of people who are not now directly benefited by the higher institutions of learning; it brings to busy people at their homes the opportunity of securing university aid and direction in carrying on their studies while engaged in the round of daily toil; it renders possible a much better utilization of existing educational facilities.

If university extension did nothing more than this; if it simply made the higher learning possible to those who are thirsting for it, who for any reason have not been able to share it in their youth or have fallen out of contact with it in their advancing age, it would still be a movement in which every thoughtful student of human progress would be interested. But it means vastly more than this. It begets and feeds an interest in higher things, which but for it would never be awakened. It stirs many a mind from a weak and slothful intellectual lethargy into a new and strong activity, with all the countless and widening circles of influence which such an awakening on the part of even one mind begets. It puts new and worthy objects of thought into the lives of people who have been content to live on in intellectual sloth and barrenness. It turns the current of thought and discussion in whole communities from the every-day gossip and tittle-tattle of small social cliques and circles into the great and broad stream of human history and science.

University extension, then, whether we look at it merely as a widening of the opportunities of our existing institutions, or as a means of satisfying the intellectual wants of hungry souls; whether we scrutinize it simply from an administrative and financial point of view as a device for rendering more serviceable our educational plants; whether we regard it merely as a powerful agency in stimulating to intellectual effort the minds of thousands of people who without it would have gone through life as in a dream, or as a means of purifying and elevating the tone of our social life in city, village and country, or as a movement with an educational mission to stir and arouse everyone to the importance to himself and the community of systematic education along higher lines, and his consequent duty not only to pursue a systematic process of self-culture, but also to urge it upon his friends; whether we consider it as a most efficient means of enlisting the sympathy and support of the community in educational matters as a whole, or as a device to get public and private support for our higher educational institutions, or finally as a great movement in the direction of social reform, which promises to be a most powerful ally of those tendencies to a higher social life in whose growth we all take so much interest—whether it is regarded from one or all of these points of view, university

extension must present itself to the thoughtful American citizen as a force which it is his duty, as it should be his delight, to conserve and increase in every possible way.

University and college extension (I use the words interchangeably in this paper) is not new.

More than a thousand years ago it occurred to the mind of a great conqueror that learning was not after all to be the exclusive property of the monks, that if it was well for the church that learning should flourish in its cloisters, it might be well for the state that it should be cultivated by the people. He saw that the influence of the priesthood came as much from their superior knowledge as from the sanctity of their office, and determined that such a factor in civilization should not be restricted to the few. This underlying principle of extension work was in the mind of Charlemagne when he invited Alcuin from England to assist in establishing schools throughout the realm. The results of their joint work helped to prepare the way for the great University of Paris, which drew thousands of students from all parts of Europe.

Every one will agree with the soundness and timeliness of the words given at the beginning of this paper, from Harvard's new President. I may be wrong, but personally I cannot conceive that institutions like Harvard, Yale, Dartmouth, Brown, Amherst, Bowdoin, and others of that class, supported by private endowments, and neither asking nor receiving financial aid from state or nation, are under any obligation whatever to carry out any forms of extension work. To be sure, their future prosperity and usefulness may depend to a great extent on how closely they keep in touch with the live problems of humanity, and so they may seek, and legitimately too, to keep alive by offering and doing this extension teaching. If they choose to be unselfish and open up their doors so that many besides those enrolled may receive the benefits to be derived from their great laboratories and their learned men, so much the better for them.

On the other hand a large number of active, virile institutions, state universities and agricultural colleges in this land, depend entirely for their financial support on acts of legislation passed by Congress and the different state legislatures. And they have a clearly defined duty towards those who perhaps never even see the outside of the college buildings, yet continually pay their share of taxes for their support.

Professor Bailey in his book, *The College and the State*, says:

These colleges of agriculture are forcing a new definition of education. The institution does not passively accept all students who come. All persons in the commonwealth are properly students of a state educational institution, but very

few of them yet have registered, nor is it necessary that any great proportion of them should leave home in order to receive some of the benefits of the institution. It is the obligation of such an institution to serve all the people, and it is equally the obligation of all the people to make the institution such that it can exercise its proper functions; and all this can be brought about without sacrificing any worthy standards of education.

It was clearly in the intent of the Morrill Land Grant Act, passed by the Congress of 1862, and was implied in the phrase which reads: "to teach such branches as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life," that such a subject as Home Economics should be included. About thirty years after the passing of the act establishing colleges for teaching, the Hatch Act for conducting experimental work went into effect.

Until recently the work of state institutions has been divided between these two agencies. Calls from outside for help came so fast that both the class work of the professors and the research work of the investigators were seriously interfered with. Coupled with this came a realization of the necessity of keeping in touch with real things, and that the college owed something to the ninety-nine per cent of the population who could not come to it for instruction, as well as to the one per cent who were fortunate enough to be able to obtain a college education. Within the last ten years about twenty of the leading state universities and agricultural colleges have established departments of extension work. The Association of American Agricultural Colleges and Experiment Stations, at its meeting last August, recognized this form of teaching as coördinate and on the same plane with college instruction and research work, and organized it as a third section. A bill has been recently introduced into Congress recommending a Federal appropriation to each state to be used in opening the doors of schools and colleges to all classes not yet directly benefited by these institutions.

If an attempt is to be made to carry education to all the people, this education must be sound, well directed, and must have some meaning to them. Extension work has savored too much of exploitation in the past. The time has gone by when extension work is done for advertising purposes. It is serious work, carried out with a definite purpose in view. It will no longer be effective when carried on with a patronizing spirit. Those who receive instruction through extension

courses have a right to feel just as much dignity in their study as though they were pursuing the same subjects within college halls.

Such, in brief, is the history of the rise of the extension idea and the status of the work in this country at the present time.

There does not seem to me to be any question as to the place Home Economics, taken in its broadest sense, shall occupy in our educational system. Manifestly it should be on a par with any other science or group of subjects. I have never been told, neither have I found a logical reason why the great women's colleges should practically ignore it. In state universities and colleges of agriculture and mechanic arts, it is now taking the place it should take—that is, one of the chief divisions. Several splendid institutions teaching the subjects which comprise Home Economics are affiliated with some of the leading educational institutions of the east. You teachers of Home Economics aim at the root of our civilization—the home. A recent writer on sociology says:

The home which is charged with the task of bringing new individuals into the world, socializing them, and furnishing them with their ideas of brotherhood and service, is by far the most important institution of society, church and state sinking into significance when compared with it.

To say the least, Home Economics has been a 'most neglected subject and it is to be hoped that from now on the opportunity will be given you, who are really the deans of this movement, to expand your work through the schools, colleges, universities, and the agencies through which extension teaching may be carried on, as has been, and is being given in a larger way than ever before, to other lines of educational work.

There is one field in which you have a unique opportunity. I tried to show at the October meeting, held in this place, that there was need of your turning your attention to country life and rural problems. No doubt there are three sets of problems presented to you, all of which need attention, viz., the problem of home life in the congested city; that of the suburban town; and that of the rural community, including the small village. While these may appear to be distinct, I am inclined to believe that they are not distinct from the sociological standpoint, but only in the kind of work which you can carry out, and the manner in which you approach the different conditions. In fact we hear too much about there being a "rural problem" and a "city problem." It seems to me they are practically one. The city continually looks to the country for new life and vigor to keep up its population

and industrial progress. The country constantly looks to the city for amusement, school advantages, and opportunity for trade. The fact that the two are so interdependent makes it absolutely necessary that the home life, the schools, the churches, and all the institutions in either be governed and directed by much the same influences, else there must be great readjustment as the population shifts from country to city or city to country.

I am not very clear in my own mind as to what the relation of departments in colleges and universities to the city community can be. Surely the same advantages for extension teaching are not offered as in either the suburban town or the rural community. Home Economics can be taught in the schools, and there is evidently need of this, for several of our New England cities range above seventy-five per cent foreign born or of foreign parentage, and these children usually have entirely different home influences than our native born children. Through women's clubs, church clubs, Young Women's Christian Associations, night schools, and by itinerant lectures both at the college or university if situated in the city, and in school buildings and churches, much work could be carried on; and yet it does not seem to me that the life of the average city lends itself very readily to this kind of work.

With the suburban town the case is different. A more wholesome home life is maintained. Usually suburban towns are alive with progressive ideas and spirit. It is not so hard to interest parents, teachers, and others in their home problems, as in the city; and there is opportunity for transferring much of the college and university teaching right into the heart of the communities through coöperating with the agencies already named, and the organization of classes for further study.

The greatest field of usefulness now open for the departments of Home Economics in colleges is that offered by our rural communities. Too much of the sociological study of the past has been devoted to urban conditions. To quote Professor Bailey again: He says:

One of the great needs of the time in social studies is that we discover the rural community.

The country must not be exploited for the city, but must be developed for itself and out of itself.

There must be a country social order as there is a city social order.

One might think from many current discussions that the country exists for the convenience and benefit of the city, providing occupation for those who have failed to attach themselves in cities, and an asylum for the undesirables.

James J. Hill is urging maximum crop production to the acre as one of the vital rural problems, else starvation faces future generations in this country. But is this all? Must not our land produce a civilization as well; or, as President Butterfield of the Massachusetts Agricultural College in his Chapters on Rural Progress says:

The farmer's interest in the political, social, and economic problems of his calling is fully as great as in those purely technical and scientific.

The argument has always been made that a woman's life on the farm was one of drudgery, that the isolation led to much insanity, and that there was no chance for social opportunity. Yet the women of the country have just as great resources as do the city women. The grange and farmers' institute movements have caused women to find themselves. They have brought culture, and given the wife a chance to take her place beside her husband. While the average women's club does not reach farm women, yet in many places the organization of town and country clubs, and rest rooms where women from the small city, village and country may meet and have social intercourse, has done much to bring about changed conditions. If farm life for women is drudgery, and if there is not at present opportunity for social privileges, then here is a chance for the Home Economics departments in colleges and universities to correct conditions which need changing badly.

There are many other ways in which a department of Home Economics can help rural communities. The grange, which has already been spoken of, offers a medium for lecture work and the organization of classes for study. The rural school buildings, idle about half of the time, could be used as a meeting place for rural school teachers and mothers, to gather and discuss with a trained home economist problems of home making. It has seemed to me for a long time that the most elementary discussion of the school luncheon by a teacher, with perhaps a one-burner oil stove for the preparation of tasty dishes, would be one of the best things that could be introduced into a rural school, and also one much needed.

The village church, used only a part of one day a week, could be utilized in a similar way. School teachers might be given some simple lessons in cooking, sewing, and other household problems, and they in turn could repeat these to their pupils.

The Home Economics department of a college might initiate a movement to have the village library well supplied with books treating of

these subjects. Every farmers' institute should have a women's section. No doubt one hundred lectures are given at institute meetings on live stock feeding to one on proper food for man.

The matter of the relation of different members of the family to each other, family integrity, and like subjects, should always be given a prominent place on the program. That home making is a vocation should be emphasized. The conditions under which children are brought up and trained needs study, not cold blooded statistical investigation, but healthy sympathetic study. The advantages of country life should be emphasized—not the sentimental side so much expounded, but the fact that people in the country live under the most normal and what ought to be the most ideal and wholesome conditions; and the opportunities for personal growth and the chance to be of service to others, is worth being made much of.

Read that little book, *What One Woman did for Farm Women*, and see how near you can approach being a Mrs. Mayo. Her work will be felt in Michigan for generations to come.

I do not know that the architecture of rural communities is any worse than that seen on the average street of small cities, but there is a chance for improvement of both. Surely the city house is not adapted to the needs of country life, and much work both in planning and location of buildings would be worth while.

The average country kitchen is usually not half as well equipped with conveniences as the farm itself. If there is any place on earth where labor-saving devices and modern conveniences are needed, it is in the average American farm house.

The matter of the sanitation of rural communities is one that affects both city and country alike. Many of our worst contagious diseases are commonly traced to farms as a source. The disposal of wastes, the protection of water supplies, and the production of clean, safe milk, will permit of all the extension lectures that can be given during many years to come. Home nursing too, and the prevention of disease, the fact that fresh air is not fatal when breathed by human beings, also need much demonstration.

There is a field for education in art, too. The fact that reproductions of the work of great masters can now be secured at the same price that is paid for the gaudy chromo, leaves no excuse for everyone not having in his home copies of those paintings which bring out all that is best in mankind.

Taste in dress, too, could be much improved. That our country

people in America should adopt a style of dress which would in any way mark them as country people, is of course not to be thought of or advocated by anyone who claims to possess even ordinary common sense. But the effect of an effort to produce a bonnet at a cost of two dollars, which shall imitate exactly the bonnet of the city woman which perhaps cost fifty dollars, may be one of the things causing some of the extremely unpleasant remarks which one often overhears.

To say that moral conditions are worse in the country than in the city is treading on extremely dangerous ground, and perhaps it would be hard to maintain such a stand if once taken. This much is true, and very generally recognized by those who have lived in the country—that there is very great opportunity constantly afforded boys and girls in the country for immoral practices. Country girls especially are not sophisticated, and the recent exposures of the white slave traffic, which would tend to show that country girls furnish a large share of the unwilling recruits of this abominable business, calls for a frank discussion, somewhere, of those topics so hard to discuss.

I have mentioned but a few of the ways in which departments of Home Economics may help, but I cannot see any end of opportunities for these departments to reach out and be of real service, through well-directed extension work.

But you will say it is absolutely impossible to reach all the people. This, in a large part, is true, and if the attempt is made to rejuvenate city or country by trying to arouse and carry individuals with you, the result will be a failure. The great problem is to train leaders. It is of no use to start desirable movements unless there is some one in sympathy with them and ready to carry them on. Such persons are to be found in every community, and one of the chief duties of the person sent out by a college department is to seek out those who will make good leaders, arouse them, and leave the local work largely in their charge.

Extension teaching ought to appeal particularly to New England educational and social workers. Did you ever think what a magnificent opportunity and field for spreading the gospel of better homes, better schools, better government, and a higher social order, you have? Compare New England with any of the much flaunted states of the middle west—I care not which one—and the odds are in our favor. I can say this without fear of being accused of New England pride, for I am not a native here, although a firm believer in her future. The agencies we have at hand for making our institutions take the place

they should in the community, according to President Lowell's definition, are multiple. Geographically we have about the same area as the average state of the middle west. A score and more of the oldest and best institutions of learning are to be found within our borders. Six colleges and seven experiment stations for the discovery and dissemination of agricultural information; six boards of agriculture conducting institutes, against one, or at the most two, in any state which you might mention; six state departments of education, compared with one in any other state; cities well organized for charitable, educational and social advancement; unexcelled transportation facilities; an atmosphere of culture; unsurpassed wealth for the support of commendable industrial and educational enterprises; and a climate and scenery which appeal to the aesthetic side of human nature, and which are admirably adapted to teaching an appreciation of the beauties to be found in the things about us. These things form a part of the heritage of the people who live in New England. When will we realize to the fullest extent the opportunities we have, and when will we begin to take advantage of them?

The criticism is often made that New England colleges are not doing for their communities what the colleges of the middle west are doing for theirs. Admitting that an endowed institution has no direct obligations to the public, that extension work for the public good is merely an optional matter with them, and comparing the land grant colleges of New England with those of the middle west, I think the answer to this arraignment lies almost wholly in two factors. First, the lack of financial support which the land grant colleges in New England have received, this small financial support being no doubt due largely to the fact that there have been so many wealthy, privately endowed institutions previously occupying the field. Secondly, because until very recently these eastern land grant colleges have been manned not by men with state university and agricultural college training and ideals, but by men whose training and ideals partook more of the nature of the eastern classical colleges, from which most of them graduated. But a new era is upon the eastern land grant institutions. Men with the same ideals which have made the state universities of the middle west useful and great, are now guiding the policies of most of the eastern colleges where agriculture, mechanic arts and Home Economics are taught, and at even the present rate of progress the time is not far distant when these institutions may be expected to be as useful to the communities on which they depend for their life as any that can be mentioned.

To quote again from President Lowell. He says:

We have a number of educational institutions in and about Boston. Those institutions are all endeavoring to reach out their hands to try and do something for the communities in which they live. But as yet there is practically no coöperation among them. That is the next thing we must bring about. At present we are duplicating one another's work. With coöperation there is no reason why we could not be, so far as instruction is concerned, a model community.

To the end that such coöperation may be cultivated and secured, a meeting of all the New England college presidents has been called early in January.

That there is need of carrying the principles of Home Economics, using the term in its broadest sense, abroad over all the land, is, I believe, generally admitted. That colleges and universities, especially those supported by state and national funds, have a duty to the communities in which they are located, and to their respective states, is also generally admitted. It then remains for this association, and for officers of such institutions as have departments of these sciences, to make possible through an increased corps of instructors a general dissemination of useful information; and it behooves those who cannot go to institutions of learning for this work to offer every facility to instructors in these subjects so that the work may be effective, and may reach every person who has ambition to improve himself, his home, and the other institutions which make for the higher social welfare of the community.

SOCIAL WORK FOR STUDENTS OF HOME ECONOMICS.

CAROLINE L. HUNT.

The publication of Professor Commons' score card for houses in the February issue of the *Journal* calls attention to a form of social service which I believe that students of Home Economics are better prepared to render than any other class in the community. Perhaps I can best convey the idea I have in mind by referring to an address made by Sidney Webb before the Social and Educational League in London about two years ago. In this address Mr. Webb used the term "national minimum" to indicate that there is a certain minimum of leisure, of sanitation, of education and of recreation which in the interest of all its citizens a nation must assure to each individual citizen. And he suggested that the "formulation and enforcement of the national minimum" offered a program for action in which all classes in society, liberals and conservatives, democrats and aristocrats, trade unionists and capitalists, socialists and individualists might in spite of their differences of opinion unite.

This is not a new idea to us, of course, though in this country we are more familiar with *state minima* than with *national minima*. Every state has established a minimum of education and as it grows more enlightened it tends to raise this minimum. In Massachusetts there is now among thoughtful people a belief that sixteen and not fourteen years should be the minimum time of preparation for life. Ohio has gone so far as to empower local boards of education to use school funds for the purpose of making it possible for boys and girls to stay in school up to the age of sixteen if they wish to continue their education instead of going to work. Oregon and Illinois have by passing ten hour laws for women in factories set a minimum of leisure. We find Miss Addams in her latest book pleading, though not in these exact terms, for a minimum provision for recreation as a necessary outlet and means of expression for "the spirit of youth." The policy of the national minimum, the policy of establishing a line below which no man, woman or child may sink or be pushed has certainly determined most of our progressive legislation in the past and it seems likely as Mr. Webb

says, to "inspire, and guide, and explain the statesmanship and politics of the twentieth century."

But back of progressive legislation there must be facts upon which to found it. You cannot, for example, insist on sunlight for every man, woman and child without having scientific facts and carefully prepared statistics to show that sunlight is necessary to physical vigor. The national minimum must be a composite of values that have been tried and proved. The experimentation necessary for the establishment of these values seems to fall to voluntary organizations. But back of the efforts of these organizations must be careful scientific work. The efforts of the public health association to assure to every man a minimum of cleanliness in his environment must be based on bacteriological data. The Consumers' League in its efforts to limit the working day is relying upon the demonstration of the existence of a toxin of fatigue or other physiological data. Playgrounds associations and public school art societies find support in scientific demonstrations of the necessity of recreation and beauty as factors in the normal, healthful life.

Professor Commons' score card is, as I understand it, one of the most important steps that has been taken of late toward determining what houses are fit for human habitation and what allowance must be made for rent in determining the minimum wage. But the card must be perfected; it must be used and criticised intelligently. I happened to be at Mrs. Richards' house when she received the first rough draft and she asked me to score her house. As a result she made certain suggestions which were embodied in the card and which seemed to me to improve it greatly. As the result, too, of this scoring a point came out that still seems to me to call for consideration. Of course I expected her house to score perfect. There was light on all sides, no houses near enough to it to cut off sun; there was window space far above the required amount in every room and all the other things necessary for health were present. I could give the house, however, a grade of only 98 because the land did not slope away from it on all sides. I may not understand this point but it seems to me that to suggest that every house must be higher than all other houses or else score less than perfect is like saying that there should never be a youngest child in any family because he is sure to be spoiled, or like saying that there must never be a last car on a train because it is exposed to extraordinary dangers. There are doubtless many other questions that will arise and have to be settled before the card can be considered entirely adequate.

As I said in the beginning, students of Home Economics ought to be able to give it the benefit of very helpful criticism. I hope that the use of the card will be made a class exercise in every school of domestic science in the country. House-scoring parties might be formed to do the work in groups thus reducing to a minimum the routine work of measuring. It would be necessary to get for the purpose an empty house or one with an occupant sufficiently obliging to permit his dwelling place to be scored. It will doubtless be possible to find a person who is thinking of renting a house and will be glad to have it thoroughly studied. Whenever possible two houses should be scored at the same time for this tends to bring out the weak and strong points in the card. Suppose that houses "A" and "B" are scored. When judged by ordinary methods and according to ordinary standards "A" appears more desirable than "B" and yet when judged by the score-card it receives the lower mark. This indicates one of two things; either that important points escaped the notice during casual observation, or else that incorrect relative values have been assigned to the various points on the card. The discussion which inevitably follows the scoring tends to determine whether or not the card is at fault.

In closing I want to express my satisfaction that domestic science as a means of showing a few well-favored families how to make and get the most out of their advantages seems to be occupying our attention less and less and that domestic science as a means of setting standards and of helping every member of the community to live up to them seems to be growing in popularity.

TEACHING DOMESTIC SCIENCE TO DIFFERENT NATIONALITIES.

[A query from a California teacher in regard to special methods of teaching foreigners was referred to Mrs. Mary E. Williams, Supervisor of Domestic Science in the New York Public Schools. The following report has been received.—ED.]

In the teaching of kosher cooking a double equipment is used in one school, but this is not necessary for all schools where Hebrews predominate. Excellent work is being done in some New York schools where the kosher laws are followed in regard only to the use of soap and also in regard to meat. Several school members in the Hebrew districts seem to feel that there are so many different degrees of orthodoxy that it would be useless to attempt in the public school to carry out to any greater extent the kosher cooking. In regard to Italian children, the course of study is the same as for other nationalities, as the little Italian children are most anxious to learn American ways. The Italians are not great meat eaters, and they are also taught their own dishes such as macaroni and spaghetti.

Extracts from a report by Miss Mollie S. Kelly follow: "The public school teaches American cooking and American ways of living. It respects all religions, but favors none." This is what a domestic science teacher in the New York public schools said in answer to the question, "How do you teach cooking to so many nationalities and religions?" To teach them American ways, however, is very acceptable to the children, for if you ask a child who has been a few years in the public school, "What nationality are you?" the answer is sure to be, "I am an American."

In regard to the teaching of cooking to Hebrew children, the dietary laws are so distinctly a part of their life that wherever it is possible, as for instance in the opening of new kitchens in Jewish districts, the kitchens are made to conform to these laws. They must be kosher, or the children will not taste anything cooked there. For instance, no soap is used in washing dishes, although soap may be used to wash the dish-cloths and towels. In the dish washing only sapolio and hot water is used. In some kosher kitchens the sapolio is of a Yiddish make,

colored pink and blue, but in most domestic science kitchens the ordinary white sapolio has been adopted.

Milk and meat are never mixed. A separate set of dishes must be used to cook and serve them and they are never combined in one dish, or served at the same meal. With the changing population in New York, one nationality replacing another, in many domestic science kitchens the double equipment is not used, the meat lessons being replaced by extra housekeeping and baking lessons.

Jewish children are very intelligent, interested, and good workers. The girls nearly all marry young, at 17 or 18, and many go no further than the public school. Even there, the thought of the future is uppermost, "I think," said one little girl, "that the nicest thing for a girl to know is to keep the house good and make the meals." Or, as the school motto, "The mission of the ideal woman is to make the whole world homelike," was rendered, "We must keep the house clean, and don't let any roaches creep round."

In a Jewish school are found many nationalities, Roumanian, Austrians, Russians and English. They are all bound by the common dietary laws, but each country's methods of cooking have been adopted.

Spaghetti and macaroni, served with cheese are of course the familiar dishes of the Italians. Cooking with cheese among the Jewish children is commonly described as "Italian cooking." The Italians use the dried peas and beans for soup, but these are never used among the Jews until the children use them in the school kitchens. The common American cereals, as oatmeal, farina, etc., are not popular dishes in the school kitchens, unless served with fruit in some such combination as oatmeal and bananas, or farina and prunes. The teacher in an Italian district spoke of "corn-meal." The children looked blank, until some corn was shown them, when a general cry of "a polent," was raised. Corn-meal mush fried with a very appetizing blending of meat or used as we would use toast, usually forms some part of a truly Italian dinner.

So many times the teacher in an Italian section finds it of great use to her to know the common Italian names for things. For instance in a class of children for whom the language was still difficult, the teacher gave the directions, "Now you may take out your saucers." No response. But at the word, "piatina," every drawer flew open. However, in the kitchen, English is used as much as possible.

Italian children as a rule are very responsive and so full of life that it is not easy to concentrate their thoughts. "My greatest difficulty," said a domestic science teacher, "is that my Italian children are so

eager to begin, they start long before they know what they are going to do." They are very anxious to be Americanized, and quick to learn American ways.

"But what good is it all—do they use it at home?" That is the question a cooking teacher has asked her much oftener than a teacher of algebra or physics, or any of the other branches. "I took my brother the cake I made and he liked it so much I made it three times." Or, "My mother said things for tea must be sweet, so she put some sugar in the tea-biscuit." The things the children learn in the kitchen are most interesting to the mothers who feel that this is something they can understand.

Miss Amelia Cohen also reports the following as to the kosher kitchen:

The main point to observe in conducting a kosher kitchen is to keep separate all dishes used in cooking milk or milk products and those used to cook meat in. This necessitates a double equipment kept in separate closets, i.e., two different sets of utensils. Even a double set of dish-pans and towels should be provided. If the pots, knives, forks, dish-pans, towels, etc. of each set are of different shapes or colors the practical working out of this idea is made more feasible—for if they are all alike they must be marked to distinguish them.

No soap or any cleaning materials which contain animal fats should be used in washing either set of dishes. However, soap made from kosher fat can be used for washing dishes used to cook meat in. In a kosher kitchen the free use of sal-soda solution, bath-brick, rottenstone, and ashes is to be recommended.

All shell fish and fish that have no scales or fins are not considered kosher. The hind part of any four legged animal even though killed kosher is not used, and all meat from the pig is excluded. All meat from the fore-quarter is put through a certain process before it is called kosher and so is poultry.

Carrying out these ideas, most dishes taught in other school kitchens can be adapted to a kosher kitchen. Examples are potatoes, whether baked, boiled, riced, or creamed; all cereals; eggs; fruits baked or stewed; junket; cheese ramekins; custards; bread, cornstarch or tapioca puddings; cream soups; muffins; popovers; tea biscuits; cakes; yeast breads; rolls and buns; all vegetables; meat (from the fore-quarter only); poultry (fresh killed and kosher); fish and noodles.

In equipping a kosher kitchen, both sets of utensils must be entirely new because the old equipment has been used for both meat and milk and therefore is considered "trefa" (not kosher).

THE TURK AND HIS TABLE.

N. TASHJIAN.

Nowhere in the world is there so rich or varied a table as in Turkey. The country is situated where tropical and semi-tropical fruits and vegetables abound, as well as products from the more temperate zones. Not only has Turkey good things to eat in abundance, but she has also an almost unlimited number of styles of cooking and serving, due to her cosmopolitan population. It is for just this reason almost impossible to make a general statement as to Turkish habits and customs of eating and living. In most of the cities, and especially among the educated class, the European manners of living and table service are adopted. The old-fashioned mode of living and eating still prevails, however, in some of the smaller towns and villages.

Here is a description of an old-fashioned dinner. The table consists of a large circular copper tray set on a low stool. Around this table the guests take position on low cushions. In the center of the table are fifteen to twenty small dishes, containing various delicacies, such as preserved rose leaves, cherry jam, grape jelly, sardines, cheese, olives and the like. A slight skirmish with these appetizers prepares the way for the real business of the hour. Course after course is brought on a big dish and set in the middle of the table, from which all may help themselves. Many of the dishes are meats cooked in appetizing ways and well seasoned. After a succession of ten or twelve courses, various fruits and sweetmeats are served and last of all comes the thick Turkish coffee served in tiny cups with saucers.

After this absorbing labor of eating, the washing of hands is essential. This is accomplished before the guests leave the table. A servant carries around an ewer and basin and each one in turn washes his hands.

Conversation does not flourish to any extent at Turkish dinners, save ejaculations of approval of any particularly tasty bit or some compliments to the hostess on her ability in cooking. In some parts of Turkey the social life consists mainly in giving big dinners to a large circle of friends. The Turk, with his characteristic hospitality and love of display, plays an ideal part as a host. The Turkish housewife prides her-

self upon taking an active part in cooking, even when she has a number of servants. There is no greater honor to a guest than to be served by the hostess herself, and with the additional knowledge that she herself has prepared the dish. The Turkish housewife is well aware that the most effective means of winning and keeping her lord's heart is by keeping a well supplied and varied table, and to this end all her attention and skill is directed from her childhood.

Turkish dishes as a rule require great skill and care and much time for preparation. I shall not attempt to describe dishes which require eight hours of cooking and a good many years of experience to prepare well. These, beyond satisfying the curiosity of some and arousing the pity of others for the poor housewife, would be of no practical use to the American housewife.

Here are some simple recipes for preparing dishes which I trust will be gladly welcomed by those who like to have something new, easy, and at the same time delicious, and which show in perhaps the most direct way the character of typical Turkish dishes. Each land has its favorite varieties of vegetables and its spices, seasoning, and so on. This means that the recipes of one country often need some study to make them suited to the conditions and materials found in another country. The Turkish dishes selected have been tested with American materials and American cooking utensils. They were studied experimentally in the attempt to prepare typical Turkish foods under new conditions.

Pilaf, which is a standard dish in Turkey, is an excellent way of preparing rice and the method described below is the easiest one, requiring only 30 minutes. Put in a pan $4\frac{1}{2}$ cups of broth or water and bring to a boiling point. Add to it a little tomato juice and season it with salt and pepper. Wash two cups of rice and put in the boiling broth or water. Do not stir the rice, but decrease the heat as the broth is being absorbed by the rice. After 10 or 15 minutes, all the broth should be absorbed and the rice thoroughly cooked, keeping still its single grains. Take the pan away from the fire. Melt a tablespoonful of butter and pour on the rice. Cover the pan with a thick linen or cotton cloth and then put on the lid. This will keep the rice soft and yet not mushy. Serve five minutes later. Never stir the rice while cooking or afterwards, as the slightest stirring would convert the whole into a pasty mass. The rice should be thoroughly cooked and still have each grain firm and distinct.

Tomatoes are a favorite vegetable in the Mediterranean region. Stuffed Tomatoes or *Domates Dolma*, to give them their Turkish name,

are prepared as follows: Select a dozen smooth and round tomatoes. Cut a thin slice from the stem, leaving a little hinge. Remove the seeds and pulp, and fill the cavity with the following preparation:

Two tablespoonfuls of cooked rice, half a pound of raw beef, 2 onions, all passed through the grinder. Season with salt, pepper, and parsley, and fry in a pan for 10 minutes, stirring all the time. Fill the tomatoes with this mixture and cover the top. Put the tomatoes into a granite pan and bake in an oven 20 minutes. Take them out with a broad knife and serve them hot.

Perhaps no dish is so genuinely Turkish as stuffed grape vine leaves or Sarma, and strange to say, this is the dish best liked by all foreigners. Perhaps the novel combination and still more novel way of cooking counts in its favor.

The careful wrapping of the tender grape vine leaves suggests to one's mind the wrapping of the green scarf (sarup) around the head of the Mohammedans. At every wedding dinner this dish is served, and perhaps quite a number of the wedding guests have spent the previous evening helping in the preparation of the 500 or more little wrapped parcels which are soon to disappear. On such occasions one of the company usually tells a tale from the Arabian Nights, while the rest are busy with their fingers. So much is this delicacy relished in Turkish boarding schools that the standing of the institution is said to be judged by the frequency with which it is served.

For the preparation of Sarma or Taprak Dolma, a hundred or more fresh tender grapevine leaves will be needed. Wash them well and boil them in salted water for a few minutes, enough to make the leaves a little tender. Take the leaves out of the water and press out all the water from them. Prepare the following stuffing: A pound of minced raw mutton and two spoonfuls of broken rice. Season with salt, pepper, and parsley, and mix them well. Take a single vine leaf in your left hand and break the stem off. Put in the middle of the leaf a little of the stuffing, the size of a walnut. Fold over it first the end of the leaf, then each side, roll from top to bottom until it looks like an inch long sausage. Place the stuffed leaves close together in a small pan layer after layer. Pour on two cups of water, cover the pan and cook on a slow fire long enough for the rice to be thoroughly cooked. A small plate will be found helpful to press down the stuffed leaves while cooking. Do not stir while cooking as it may unfold the vine leaves. The secret of the dish is in preparing so that the rolls will keep in perfect shape and the leaf and stuffing not come apart. This

is served with some sour sauce, ten to fifteen of these being enough for one person.

Egg Plant Pie or Mousakkah is an example of a well-seasoned dish made from a vegetable which itself has no very marked flavor. Slice half a dozen egg plants lengthwise one-fifth of an inch thick, salt each slice and put in piles under a weight for several hours. Wash off the salt and fry until slightly browned on both sides. Take half a pound of minced raw meat, season and fry in its own fat until well cooked, stirring all the while. Put in a baking pan alternate layers of egg plants and the prepared meat, add just a little water or tomato juice or a few sliced tomatoes if desired. Bake ten minutes or until well browned. Serve hot.

Turkish egg plants are slender and long, and have a sweeter or more decided taste than the ones here. It is not necessary in Turkey to put the egg plants under a heavy weight. They can be cooked right away.

Stuffed Oysters are a favorite Turkish dish, the smooth-shelled oysters common in Turkey being used. These are not obtainable in the United States but in the study of American materials and Turkish dishes it was found that American clams could be substituted with good results. They should be prepared as follows:

Wash four dozen clams well and put them in boiling water till the shells begin to open. Prepare the following mixture for stuffing the clams: Cut 5 large onions very fine, mix it with a teacupful of rice. Season with salt, pepper and parsley. Put in a frying pan a teacupful of olive oil and fry in it for a few minutes the mixed rice and onions. Stir it all the while, so that the onions do not burn or get brown. After the onions are slightly softened, remove from the fire. Open each clam, remove the loose membrane, put a little of the stuffing in and close the shell. Be careful not to pull the shells apart. Arrange the clams in a baking pan layer after layer. Barely cover with water. Cook until almost all the water is absorbed and the rice cooked. Decrease the heat gradually. Serve either hot or cold.

All Turkish dishes have an individual taste and appearance, due to the cooking of vegetables and meat together. In this way the meat imparts to the vegetable some of its essence, while the vegetable yields its delicate flavor, giving an altogether individual taste to the dish. In Turkey vegetables are very seldom served merely boiled, they are either fried after dipping in egg or prepared with meat. These combinations give rise to innumerable ways of preparing various dishes, and for this reason Turkish meals are never in danger of becoming monotonous. A

well organized home would never dream of serving the same dish twice within a week or two. In America, most vegetables are just boiled, seasoned, and served separately with the meat. This has its own advantage no doubt, and the simplicity of preparation may have been its great attraction, but this is the great cause of the sameness of American meals.

Sweets are much relished in Eastern lands and Turkish sweetmeats are perhaps the food products which are most familiar outside of Turkey for Turkish Delight and similar kinds of confectionery such as Rahat Lokum, Paklava, and Kadaif, are very popular in Europe and the United States. Recipes for the preparation of such Turkish sweetmeats can be found in journals and books which are concerned with cookery.

The examples and descriptions of Turkish dishes which have been given are sufficient to show something of the character of the foods and the ways in which they are eaten in Turkish homes. Anyone familiar with the subject will concede that the Turk has an abundant and varied diet, and it should be clear that the list of palatable foods and dishes is a long one. Indeed, this might be expected, for cereal crops and farm animals are raised in abundance in Turkey. Fruits and vegetables are grown in great variety, Turkey, like most of the Mediterranean region, being a very favored spot from an agricultural standpoint. Furthermore, skill in cookery is a matter of pride with Turkish housewives.

THE PASTEURIZATION OF CITY MILK SUPPLIES.

MINNA C. DENTON.

The details of the process of pasteurization as practiced in different localities and by different physicians and sanitarians vary widely. It may mean anything from ten or fifteen minutes' to thirty minutes' heating at a temperature of from 60° C. (140° F.) to 75° C. or even 80° C. (176° F.) As a rule, the higher temperatures and longer periods of time are the standards recommended by earlier authorities, more recent ones having recognized two important facts, first that the undesirable changes produced in the heating of milk for a number of minutes at 75° or 80° or even 70° C. take place to almost as great an extent as if the milk were boiled; second, that a large percentage of non-spored bacteria, including all pathogenic forms (under properly arranged conditions) are killed at 60° C. maintained for twenty minutes, thus making the milk as safe as the somewhat higher temperatures which still fail to destroy the vitality of the spores.

In order that pasteurization shall accomplish the maximum benefit, other details besides the degree and time of heating must be attended to. A complete definition of the process would cover the following points:

(1) Exposure for a few minutes (10 to 20) to heat not above 70° C. (158° F.), or preferably 5° to 10° C. lower than that, and under the following conditions:

(a) The vessel in which the milk is heated must be covered closely and filled to the cover or almost so; for exposure to any considerable body of air (or even vacuum) promotes the formation of a scum or film on the surface of the milk, and bacteria caught in this surface film withstand heating much longer than do those in the fluid milk. This has been definitely proven for *B. tuberculosis* by several competent observers.

(b) A much more nearly ideal arrangement if practicable would be the heating of the milk in its final containers, *i.e.*, the glass bottles in which it is to be distributed. This avoids reinfection, or contamination during bottling, always a considerable source of danger, but it

adds much to the cost of the milk, on account of the increased manipulation and increased attention required, necessity for better grade of glass bottle, etc. Furthermore, the time required for this process is so great as to exclude it from use by any large company, and there are other objections to it from the practical standpoint.

(2) Immediate and rapid cooling of the milk to a low temperature at least 16°C . (61°F .) or much better, 7°C . (45°F .). Without this precaution, the heating of the milk not only does no good but actually causes harm. For bacteria grow very rapidly (20 to 30 minutes is often the lifetime of the individual, in many forms), and especially at lukewarm temperatures, the degree which milk left to cool at room temperature maintains for two to four hours. Moreover, many undesirable bacteria will usually grow more readily in milk that has been heated, other things being equal, than in raw milk. This feature, it should always be remembered constitutes a serious objection to all pasteurization.

In home pasteurization where the milk is to be used in an hour or so, this cooling process is of course unnecessary. Otherwise the warm milk bottles should be cooled at once in running water or frequently changed water, before being set into the ice box.

(3) Maintenance of a low temperature during transportation, storage, and delivery of the milk, both before and after pasteurization, also during storage after delivery to the consumer. The temperature of 10°C . (50°F .) is usually indicated as the maximum that should be permitted.

(4) Care to use a pasteurized milk for purposes of infant feeding within twenty-four hours at most. Even though it may seem perfectly sweet, this does not, under present conditions, prove that no harmful changes have taken place in it. This maximum of twenty-four hours should be reduced when possible for infant use, in cities where milk of various ages from various sources must be transported long distances both before and after pasteurization—particularly in summer heat, or with insufficient refrigeration facilities.

Effect of heat upon milk.—The boiling of milk is said by various authorities to cause certain chemical and physical changes, as follows:

(1) The various proteins and nitrogenous bodies are known to be changed to some extent, though authorities do not agree as to details. It seems however, that certain of them (lecithin and nuclein) are more or less decomposed, the milk albumin becomes less soluble and be-

gins to coagulate, even at 55° to 75° C. (according to Solomin, Schlossmann, Snyder, Rosenau); caseinogen is attacked, with the result that it is more slowly and imperfectly acted upon by ferments (rennin, pepsin, pancreatin, especially the first named); traces of hydrogen sulphide are formed, probably by cleavage of protein substances.

(2) The mineral salts or inorganic matter of milk are somewhat affected. There is some precipitation or fixation of soluble calcium (and magnesium?) salts, forming (probably) the insoluble tricalcium phosphate (Kastle), also some calcium citrate (probably); caseinogen has a part of its lime salts split off (Swithinbank). Some of the organic phosphorus (of nuclein, lecithin, etc.?) is oxidized to inorganic phosphates. The modern point of view, that the linkage of these mineral salts with the otherwise inert protein molecule is of the utmost importance in biological as well as in other physical and chemical reactions, would indicate that the above-mentioned changes may have great significance in estimating the nutritive value of heated milk.

(3) The fat emulsion of normal milk is interfered with, because the clusters of globules are broken up and the fat more uniformly distributed throughout the liquid, perhaps also because the viscosity of the milk is decreased by heating and so the fat has greater difficulty in rising, or because the salts are deposited on the surface of the fat globules. In any case, the cream fails to rise, or is much thinner than that on raw milk, and does not whip into a froth.

(4) Lactose is affected; it is sometimes said to be partly caramelized; its specific rotatory power is changed. (Undoubtedly some caramel would be formed when it is allowed to scorch on the bottom or sides of the containing vessel.)

(5) Carbon dioxid is expelled, and so are certain other gases and volatile substances.

(6) The cooked taste develops; whether it is due to changes in milk proteins, or sugar, or only to the driving off of gases and volatile substances, is not known.

Which of these changes is also produced by pasteurization? That depends upon the temperature at which pasteurization is performed. At 80° C. (176° F.), all of them appear, only to a less degree than at the boiling point; between 70° and 80° C. (158 to 176° F.), most of them appear at least to some extent (but authorities differ); between 60° and 70° C. (140° to 158° F.), very few changes appear. Rosenau says that the fat globules are affected by thirty minutes at 65° C. (150° F.); and some authorities claim effects upon lact-albumin at 60° C. or

even below, though others put this at 75° C. At 60° C., if heated for not more than twenty minutes, most agree that there is no appreciable change in physical condition, chemical composition, or flavor.

The importance of these changes to the bottle-fed infant, when the heating is such that they do occur, is variously estimated. The unfavorable conditions with which they have been most commonly connected are such as precede or accompany scurvy, some forms of anemia and rickets. It has been suggested that the oxidation of organic phosphorus and calcium by heating is directly related to the lack of phosphorus and lime in the bones, which occurs in rickets, and much evidence has been adduced to show that this is the case. Recent opinion agrees, however, that so far as they have been made out, the causes of this disease are to be sought in a different quarter, bad air being frequently alleged as prominent among them.

The cause of scurvy is not known. But, however much authorities disagree concerning it, there is substantial agreement that scurvy due to pasteurized (not boiled) milk is rare, and also that the dangers of a warm, dirty, stale milk (*i.e.*, the ordinary city supply), fed to the infant, more than counterbalance any slight danger of scurvy. This is more especially true, as infantile scurvy is easily preventable and easily treated, responding in a few hours to the use of such antiscorbutics as fresh milk, orange or grape juice, beef juice, etc.

As to other conditions of malnutrition or physiological reactions due to the prolonged use of highly heated milk, English and American physicians, at least, seem often to consider that many children do not do well for long periods of time upon boiled milk. A common and well-founded notion is that boiled milk is constipating not only to children but also to most adults. To what extent these observations would apply to pasteurized milk, depends upon the nature of the pasteurizing process. Some authorities consider pasteurized milk less easily digestible than raw milk, and others more so. Other changes wrought in milk by heat are as follows:

(1) Milk contains a number of enzymes. Among these are the proteolytic (trypsins, *e.g.*, galactase, which according to some authorities plays so important a part in cheese-making), the amylolytic or starch-digesting; the lipolytic or fat-splitting, a lacto-kinase (a ferment which accelerates though it does not cause the digestion of lactose in the intestine), the catalases (ferments which are able to decompose hydrogen peroxide), oxidases, and peroxidases; and so on. It must be confessed, however, that evidence as to any considerable im-

portance of the natural milk ferments in the infant's nutrition is mostly wanting. As to the effects of heat upon these ferments, those found in cow's milk are, in general, weakened by thirty minutes at 65° C. (150° F.) and totally destroyed between 70° and 80° C. (158° to 176° F.), by a much shorter period of time. It would seem, then, that the most recent pasteurizing standard, viz. 20 minutes at 60° C., does not harm cow's milk in this respect.

(2) Milk contains, occasionally, various bacterial products and antibodies. Animals rendered immune to diphtheria or to tetanus excrete the antitoxin in their milk. As is well-known, the milk of a sick cow is likely to be unwholesome; and specific toxins are supposed to appear in the milk when the corresponding infection is a general one.

Of the antibodies, the only ones which could under ordinary circumstances be of any conceivable value to the infant are those connected with the so-called germicidal power of cow's milk. It has long been known that there is a slight decrease (or at least an apparent one) in the number of bacteria in new milk, for two or three hours or sometimes longer, though it is slight indeed compared with the enormous increase which takes place immediately afterwards and continues until hosts almost innumerable are reached. It is sometimes supposed that the bacteria which disappear in new milk are killed by some antagonistic substance which the milk contains. It is possible, however, that, what the milk contains is not bactericidal substances but agglutinins, that is, some substance causing bacteria to form in small clumps or clusters, thereby resulting in an entire cluster being counted as one bacterium under ordinary counting methods, and the decrease being apparent and not real. In any case, this action of milk cannot assume much importance in relation to pasteurization for two reasons: first, it is in fresh milk often so slight as to be practically negligible; and second, so variable as to be perfectly unreliable.

The question of bacterial toxins in milk and the effect of heating as possibly favoring the production of these toxins, is not so easily disposed of. It is well known that a milk loaded with undue numbers of bacteria, as is the average city milk in hot weather, acts in many cases as an irritant to the delicate mucous membrane of the infant's digestive tract, whether because of the presence of the bacteria themselves and their ability to break down the normal defenses of the intestinal epithelium and pass through it, or because of the irritating nature of their products in the milk in which they have fed and which they have profoundly altered, or because of both these conditions.

Be that as it may, statistics show an enormous increase in the diarrhoeal death-rate during the hot season, and that the bulk of this increase is furnished by the "under-one-year" deaths from the bottle-fed infants of the poorer quarters of the city, especially. The inferences usually drawn are that cow's milk in the condition in which it reaches the average child in hot weather, is by no means invariably satisfactory as a food; and that its unsatisfactory condition is often connected with the enormous increase in its bacterial flora which takes place at such times.

Now there is no doubt that this all too common condition is due in part, at least, to specific infection—say to pathogenic streptococci (though to be sure, the relation between the pathogenic and the ordinary milk streptococci is not at all understood), or to bacteria belonging to or related to some one of the "intestinal" or colon-typhoid groups. Further, this infection may be carried by the milk, or by flies, or because of unclean personal habits or defective sanitation. It seems, however, that specific infection does not always take place; often the trouble is due, apparently, to large numbers of "ordinary" bacteria or their products in the milk. Dr. Park's now classic investigation led him to conclude that heating the milk to slightly above 170° F. (77° C.) does much towards destroying not only the bacteria in milk, but also towards removing at least a part of their irritating and poisonous products. It served to prevent intestinal troubles almost completely when the milk used was of good quality; but even when the most impure store milk was used, it usually proved effective if the milk was heated shortly before use, unless the original contamination amounted to many millions of bacteria per cubic centimeter. With raw milk, even that of good quality, the majority of infants suffered more or less from diarrheal troubles and many of them seriously so. Only the purest milk, then, should be used raw, especially in summer.

The results obtained by Dr. Park in combating the dreaded summer gastro-enteritis of infants with the weapon of pasteurization are by no means isolated. Dr. Freeman and others produce statistics to show that the infantile death-rate of New York City was cut in two within the space of 14 years by the introduction of the habit of boiling the milk. Mr. Nathan Straus, whose charities in connection with the milk depots and the consultations for mothers at these stations, have done so much for the New York tenement district, reports similar results elsewhere whenever his pasteurizing methods are tried, both in America and in Europe. Thus, in Sandhausen, near Heidel-

berg, in 1908, the infantile death-rate dropped to less than half the usual average for other years, after four months' work. The infants' hospital at Randall's Island (New York City) had a mortality of 44.36 per cent in 1897; in 1898 it began using the Straus pasteurized milk and had a mortality of 19.80 per cent. Dr. Hope, at Liverpool, using humanized sterilized milk at the infants' milk depot, secured a reduction of 50 per cent in the mortality of these children as compared with the general mortality rate of infants in the rest of the city. Pasteurization of the city supplies in Vienna gave a decrease of 50 per cent in infantile mortality, we are told. Many workers in French and German cities report similar results. It must be remembered, however, that general sanitation goes hand-in-hand with pasteurization, in all of these cases, and how much credit belongs to the one and how much to the other, it would be hard to say.

The contention of Flügge and others, that pasteurization should be forbidden by law, since it kills off the non-spored lactic-acid forming bacilli and so leaves the field clear for the toxin-forming spore-bearing peptonizing and putrefying anaërobes, seems to be answered in part by the above investigation and experiences. It is doubtless true that upon many occasions, if a previously heated milk sample be kept long enough, toxin-forming bacteria may form extensively in it; that some of these toxins are very powerful, and that not all of them are destroyed by heat. Whether this would be likely ever to happen with the average city milk produced under conditions approaching decency, kept moderately cool, and promptly used, is of course another question.

Recent work by Colwell and Sherman, on the determination of peptones in a pasteurized milk as it ages, shows us that the high-temperature pasteurization does favor the growth of the peptonizing bacteria at the expense of the lactic-acid formers; but they report that where the lower pasteurizing temperatures are used, the lactic-acid-producing bacteria grow at about the same rate as do the peptone formers. Thus the objection, that pasteurization interferes with the natural souring of the milk and makes it more difficult to recognize an old or an unsafe milk, is losing ground so far as low-temperature pasteurization is concerned.

It cannot be too strongly emphasized, however, that the nature of the flora in milk does vary enormously with different sanitary and other conditions. I have known of localities in which it seemed to be a common knowledge among housewives, that if a bottle of milk kept in the ice-box or say just outside a shaded window in winter was to be

used late in the day or kept over until the next day after it was delivered, it must have the paper cap removed to allow access of air; otherwise it would be "not sour, but bad—funny-tasting, you know." It would seem that from imperfect sterilization of bottles or from some other source, there must have been present an unusual number of putrefying anaërobes. Some sanitarians tell us that one of the tests for an average good milk, even after it has been pasteurized, is its failure to putrefy at room temperature within 48 hours (though for this test they usually remove the cap and substitute therefor a sterile cotton plug). It would seem, then, that raw milk kept on ice or otherwise cooled ought not to putrefy within twenty-four hours though kept closed up in ordinary bottles.

Rosenau briefly sums up the evidence for ptomaine formation in milk as set forth by Flügge, Vaughan, and others, and decides that its relation to the poisonous qualities of milk is doubtful; that probably most of the irritating organic acids of ordinary fermentation, as well as the volatile acids produced by anaërobes, "when they produce acute symptoms, result more from fermentative processes within the gastrointestinal tract, rather than from those produced in the milk before it is taken." It should be remembered that the opportunity for milk bacteria of various sorts to preserve their vitality and finally to succeed in setting up fermentation processes within the alimentary canal of the infant, is comparatively great; since the very young child's gastric juice normally lacks hydrochloric acid and therefore has little disinfecting power.

Apart from the connection of the milk supplies with the infantile diarrhea death-rate, what is the value of pasteurization as a preventive measure against the dissemination of tuberculosis, typhoid fever, scarlet fever, diphtheria, chicken-pox, small-pox, measles, cholera, foot-and-mouth disease, anthrax, or any other diseases which may possibly be spread by means of dairy products?

There has been a good deal of discussion as to whether *B. tuberculosis* is killed at pasteurizing temperatures, it being especially resistant under certain conditions, *e.g.*, in the scum which readily forms over the exposed surface of heated milk; or in case it be found in collections of mucus or pus—a condition which should be readily detected with the eye. Theobald Smith, Rosenau, Russell and Hastings, and a number of other workers whose decisions carry the weight of authority, have announced that 20 minutes at 60° C. (140° F.) is amply sufficient to insure the death of this refractory organism, even so few as ten

minutes being ordinarily enough, provided milk which contains mucus or pus be rejected (as it most certainly should be), and provided precautions are taken against scum formation.

The thermal death-points of the other pathogenic organisms mentioned above, so far as we know them, occur at lower temperatures. Rosenau reports that *B. typhosus* is killed by two minutes at 60°; that diphtheria often disappears in the first minute at 55°; that *B. dysenteriae* may sometimes withstand five minutes at 60°, but never ten minutes. Pasteurization, then, would be an efficient guard against the spreading of their infection through the milk supply, provided an adequate and rigid system of inspection can assure us that there is no danger of infection subsequent to pasteurization through persons who handle the milk.

But what is the danger that these diseases would be disseminated in any event, by the milk supply? So far as tuberculosis is concerned, it must be confessed that it is mostly hypothetical. Somewhere from 2 to 20 per cent of our milk does contain tuberculosis germs—estimates vary greatly; but are they dangerous to man? The bovine tuberculosis germ differs somewhat from the human, being usually much lower in virulence; yet human tuberculosis has in some instances been contracted from bovine sources. Estimates as to its frequency vary from that of von Behring, who maintains that practically all cases of tuberculosis have been incipient since infancy, when the germs were taken into the system with cow's milk, to that of Koch, who believes that eleven-twelfths of all tuberculosis and probably all pulmonary tuberculosis, is of human origin.

When it comes to typhoid fever, we are more sure of our ground. Many of the violent epidemics due to milk have been recognized and described. Whipple estimates that in large cities, about 25 per cent of all typhoid cases have been infected through milk and it becomes increasingly clear to us that when the water supplies are made safe, milk is the most important remaining source of infection.

As for scarlet fever and diphtheria, the danger of their more than occasional transmission through milk is now well understood. Many sanitarians consider that they are probably more largely disseminated through milk than is tuberculosis.

To summarize: Most of the objections to pasteurization are founded either upon certain undesirable results which obtain when the milk is heated for some minutes to above 70° C., or else upon the supposition that pasteurization will be made to take the place of

attention to cleanliness and sanitation. Presumably the reason why health authorities in a number of the largest cities favor scientific pasteurization is that the work of raising standards of cleanliness and sanitation among so great a number of far-distant milk-producers proceeds so slowly and is so far from complete, that they deem some additional safeguard necessary for that part of the milk-supply which falls below a reasonable minimum standard. Presumably, then, this proposal for pasteurization does not mean a relaxation of sanitary inspection in any quarter. Neither does it mean that no supply except pasteurized milk will be available; though the price of a clean safe raw milk, in a large city, must for some time to come be much higher than are the present city prices, just as we find "strictly fresh eggs," "fresh eggs," and "eggs," selling at different prices.

It is true that there are a few smaller cities which have already been able to attain some measure of success in reforming the dairy business; conspicuous among these are Copenhagen, Denmark, the world's model in this respect; and in this country, Rochester, N. Y., where Dr. Goler's work reduced the infant mortality one-third within ten years—and that without the use of any heating process whatever. But in a city where much of the daily supply must be brought a distance of from 100 to 400 miles, conditions are much more difficult, and extensive reform naturally proceeds more slowly.

The great dangers of pasteurization are: (1) That improper methods of pasteurization may be employed; (2) that improperly handled milk may be pasteurized, and (3) that milk after pasteurization may be improperly handled. But the attainment of a reasonable degree of safety in these respects, may be for some time to come a much simpler matter than the attainment of the higher standard which should be required to make a raw milk safe enough for infant feeding.

REMARKS ON FOOD STANDARDS IN THE PUBLIC KITCHEN AND THE HOME KITCHEN.¹

BERTHA STEVENSON.

However much we may criticise the housekeeper, we must admit that she still produces the very best food, including the most difficult of all things on the bill of fare—bread. Of course everybody here knows that good bread cannot be made unless it is mixed thoroughly. Each particle of flour should be surrounded by moisture so that, when the dough goes into the oven under heat, hydration can take place. In the best bread there is very little unhydrated flour; whereas all of the bread made in public bakeries in this country that I have ever seen examined in the laboratory shows big streaks of raw flour.

There was on the market a few years ago a little machine which was built on the right principles and which was a help in bread making. The wet ingredients were put in the bottom, and the dry ingredients in the top; and the dry ingredients were sifted down very slowly, while the wet ingredients were stirred very fast, and thus a good mixture was obtained. But that machine I think is not adapted to use in bakeries. As far as I know, the kind that is used in every bakery today is the big, old-fashioned sort of cylinder with square ends, in which a great arms turns, and mashes and jams everything together; and when the dough comes out it is like rubber. Some of the bakers will show the dough to you with great pride and say, "Just see how it stretches!" As a result of better mixing home made bread is better although it is often not as well baked.

When we compare her food in general with that of the public kitchen, the housekeeper deserves every bit of glory she has. Why do you think it is that we do not feel easy about eating hash in a public lunch room? We can eat it with our eyes shut at home. A young woman said to me recently, "You know, when I first went to work in a restaurant, I had no idea what restaurant habits were." She continued, "Here are two things that opened my eyes: The first week, one morning, a large

¹Read at the Boston meeting of the Home Economics Association, January, 1910

number of salmon, frozen stiff, came in to be used for lunch. The professional cook whacked them all into the ovens without dressing them. I said 'Why do you do that?' 'Oh,' she replied, 'they will be so much easier to dress when they come out!' My next lesson was from some forgotten lamb chops. These chops had got pushed back in the refrigerator and overlooked for about two weeks. When they were discovered they were boiled in soda and made into braised lamb chops, with spiced tomato sauce. And, said my friend, They were delicious, one could not detect anything wrong with them." A professional cook is usually incurable. It is better to advertise for women to train as cooks. Never advertise for a cook.

It is so easy to doctor food in a thousand ways. Eggs, for instance, that are spoiled give up their offensive odor on being frozen. An investigation of public kitchen methods would make it clear that all of the good accomplished by the pure food laws is insignificant compared with what could be accomplished for better health in our cities if the dirty restaurants could be cleaned up.

There are a good many difficulties in the way of clean restaurants. The business buildings available for restaurants offer far from ideal conditions when the kitchen is viewed as a laboratory. Moreover, to place a restaurant in convenient reach of the many means enormous rents and a close margin for improvements. Outside of the endowed institutions and hospitals, a model kitchen is as much out of reach as is a half-acre playground for each family in the tenements. Still, if there is knowledge enough and effort enough, conditions can be made sanitary. This is no more than is done in surgery; for example, if an operation is to be performed, one can get sanitary conditions already provided in a hospital; but, if it is not convenient, or if for any reason the operation must be performed at home, the home conditions, the home room, can be made sanitary. So it is with respect to the kitchen, as we find it; it can be made sanitary and kept so.

Then, too, the public has not waked up yet to the necessity for supporting proper standards in foods. Every year we come across a difficulty when strawberries appear. They start from across the continent; and, in the early season, by the time they get here, at least half of them are soured and crushed and are not in proper condition for this market. Then the few strawberries that have ripened nearer by are at a premium, and only people very well-off can afford to buy them. But the minute strawberries appear, a demand is made for strawberry short cake. And every year some of us who are in the lunch-room business

go through with this same thing. We explain, when we are asked to have strawberry shortcake, that strawberries are too expensive, and that we have to wait until the near-by strawberries are more plentiful. And then the reply always is, "Well, So-and-So has strawberry shortcake now. If you can't play the game, what is the matter?" Well, the way So-and-So has strawberry shortcake when good strawberries are really not in the market is this: There are a great many second-rate, half soured, crushed strawberries, and a very few good ones. So it is very easy to buy five crates of crushed one that are not fit to eat, and crush them some more, and sweeten them and make a strawberry shortcake, and buy one crate that is good, and put two or three good berries on the top of each shortcake. When we tell this to our patrons, we always get the reply, "We don't know anything about that." And we always reply, "But you have *got* to know about it."

Again the workers in the restaurants, other than the cooks, present one of the difficulties in trying to serve really clean food. Many restaurants workers think it is fussy not to pick up a piece of bread that falls on the floor and put it back on the table—I mean downstairs; of course, they don't do that before the customers. But these same people, when they really get interested in the work and are trying to do it well through and through, begin to think and then they say, "It is not square to pick up a piece of bread off the floor." I think it is encouraging, when a girl who starts out thinking it is fussy, decides it is not "square" to do behind a customer's back what she would not do before his face.

A strong effort is being made by those who really regard the work in a professional light, to meet and overcome these difficulties and the many others that we have not time even to name here. As for the workers' time, patience and training often bring indifferent workers to a point of enthusiasm and pride in a daily joint effort to prepare and serve the very purest and cleanest food, the kind that the best home kitchen would be proud of; food that not only tastes good and looks good, but that *is* good. And knowledge and diligence, as I have said, will secure sanitary conditions.

When it comes to awakening the public to a greater demand for, and a better support of, proper food standards, nothing is more effective and helpful than this Association. Each member here can and does do a great deal to bring people to realize the benefit or harm that can be wrought by public kitchens.

THE ELIMINATION OF WASTE IN THE HOUSEHOLD.

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Conservation of our resources should be understood to apply to housekeeping, as well as to mines and forests. We need to be interested in civic and national affairs, for only when these are rightly conducted can homes be ideal; unless street cleaning is properly done, house cleaning cannot be very effective. If the vacuum cleaner is allowed to dump the dirt cleaned from the rugs of a house on the street in front of the house, the dirt will find its way back to the same rugs from which it had just been so scientifically extracted. An English writer calls attention to the fact that, after arousing great sympathy for the chimney sweeps and abolishing their employment, *all* Londoners are now in very nearly their condition of griminess and lack of sunshine! Here, also, in many of our cities, vast amounts of money and energy must be spent in the houses in attempts to fight the deposits of soot from without.

In spite of the use of conspicuous waste as a means of showing superiority, there is in most persons an inherent aversion to waste of what to them seems valuable. Many persons are, from ignorance, unable to realize the value of commodities which they are accustomed to seeing in quantity, and forget how valuable a little of it might be to some less fortunate person. Such persons are careless at large, in the destruction of forests, and the pollution of rivers; and, at home, in wasting water, and taking on their plates more food than they eat. All these short-sighted persons must be taught. Let us see that economy at home and abroad are closely related, and let women learn to apply the laws of economics to the household. The housekeeper should also learn a lesson from modern manufacturers who make fortunes in by-products, formerly thrown on the dump heap. She should carefully balance her raw materials and finished products in search of waste, for in a properly run household all space, time, and energy should be so utilized that some desirable end is thereby accomplished—health, morals, or intellectual and spiritual development.

The question of waste of time in a household is the most discouraging, as it is due to the long years in which the housekeeper's time has been considered as the least valuable in the world. Some irregularity is unavoidable, but every woman should endeavor to run her affairs as punctually as possible, and eventually compel her family to realize the injustice of tardiness. One of the greatest aids to time saving is routine, but it must be so arranged as to give elasticity, and allow for emergencies. One does not want such a routine as that of the little German girl who would take cold from taking a bath on Wednesday rather than on Saturday, or to have a whole week spoiled by a rainy Monday. If, however, we were compelled to decide afresh each day just what work, sweeping, washing, or baking, we should do that day we should be severely handicapped. Another advantage of routine is, that in looking at work by the week-full, rather than by the hour or day-full, it is easier to distinguish between necessities, and non-necessaries—and when that distinction is made there comes a great saving of nervous energy. In fact, it is not only that non-necessaries are needing elimination, but often also that impossibilities are being attempted. One woman cannot, without too great nervous wear, be a pleasant companion, a fancy cook, a nurse, an expert musician and an authority on current events. A modern housekeeper must look over her field, decide first what are the possibilities for herself, and second, which of these are worth while, and then lay the emphasis in the right place. She must realize that it may be best for her next door neighbor to emphasize a different thing and they will be happier when they learn to supplement each other instead of copying. Such a woman will then be ready to realize that she will waste her employee's nervous energy, as well as time, if she does not properly arrange the work.

Professor Seager gives, among his economic laws, that of adaptation to taste. Unless this is realized in the household, we might as well live in hotels or in barracks. It is frequently dealt with, so far as concerns the family, but rarely, at least in point, where it concerns the help, but with that in view, a woman does not seem unreasonable who changes her service place several times in trying to find one where she can work without undue friction, for many housekeepers never seem to realize that their employees have tastes which should be gratified. Even a greenhorn prefers to work in the order that she herself chooses, rather than in that imposed on her by her mistress and in many cases her plan will be really as good a one. On a day when all the family

is to be from home, consider the pleasure to the cook in her choosing just what meat and vegetables she shall have for her own meals—not merely a collection of left-overs. It may be pork and cabbage she will choose, but it will be a token of her individuality.

Another waste of nervous energy for household helpers comes from a very hazy conception of what is expected of them—or, more frequently, and still more unfortunately, a very clear conception that they are to work all day, no matter how hard. According to *The Survey* there is now a law in Holland (since February, 1909) requiring a contract signed by both parties in all cases of employment, stating wages, conditions, and amount of work.

Physical energy—mere human power to do work which can be measured in feet, pounds, and time—is, on the whole, more easily comprehended than nervous energy. Proper technical training develops hand and mind together, and though I believe every woman's college should have a department of household economies, still every home should be a school of practice. How much too frequently the home is merely a parade ground in the front part and a sweat shop in the rear where all work superficially to outshine the neighbors! Some one has lately expressed a wish for a "fashion of economy." There are faint beginnings of it apparent. A wealthy woman of much education, in giving a dinner at a very luxurious hotel, surprised some of her guests by the small number and simplicity of her courses. It seemed quite like a modest home dinner, well cooked and satisfying, but without superfluities. In conversation afterwards, she explained that she felt that if twenty people there had on their plates twice what they could eat, twenty other people were starving because of her carelessness. This can be taught to even the ordinary maid of all work. A careful, conscientious housekeeper of my acquaintance was explaining to a temporary maid, a friend of the regular incumbent, the work required. The newcomer said with real admiration, "Yes'm, we all know that whoever comes here can have all they need, but you won't stand us wasting things."

Women need more and more to learn to buy and care for proper appliances. Everyone who has kept house knows either the joy of good tools, or the woe of poor ones. The reason for the latter lies sometimes in stupidity, sometimes in stinginess, often in false economy, very often, alas, in necessity—but the world will have to come to an appreciation of the fact that if housekeepers are to keep step with modern progress, they must have improved tools.

On the other hand, women are apt to treasure too many useless things. There is a good lesson in a rather charming story—*The Resurrection of Miss Cynthia*, by Florence Morse Kingsley. The heroine was left alone with many heirlooms and poor health. She was told by a specialist that she had but one year more to live. She decided she would enjoy that one without wasting care on the accumulated débris of her ancestors, so she had in her back yard a bon-fire of really worn-out things, and in the front a pile of half-worn ones. The latter soon disappeared as the result of an advertisement that the neighbors might help themselves from it. Then, free from care, she roamed the fields and recovered her health. Professor Patton says that one stage in individual, æsthetic development finds expression in mere ownership, and that people should be allowed to satisfy that instinct at some time. Though this should give us sympathy with those just becoming able to satisfy it, we need not remain indefinitely in that stage. Rummage sales are a good antidote when the stuff has been bought but preventive measures are better in the form prescribed by Mrs. Richards, "Before the purchase is made, the labor involved in caring for it should be considered."

Another of Professor Seager's laws is that of "least social cost." It is inconsistent to belong to the Consumers' League, or to demand union-made stoves, and at the same time require at home services and refinements that can be attained only by soul-killing work. We want tasteful serving of food, but there are many people who only need to count the number of dishes per person required to serve their breakfast and then either cut down their demands, or hire more help. Wells, in *New Worlds for Old*, paints a pleasant picture of the future and one phase is the new feeling of responsibility about making work. Why should not each person put his bed to air, and clean the tub after his bath; in short, leave things as he found them? Only a housekeeper can really appreciate the saving of labor which would result.

As with the present industrial conditions it is unwise for the average family to invest much capital in a house from which they may at any time be called by a change of work on the part of the bread-winner, it seems inevitable that most families should live in rented houses. The chief drawbacks to this are, first, that tenants are apt to be careless with rented property; second, that owners, on that account, put in cheaper material; and third, that this finally reacts on the tenant, who finds it harder and harder to find a well-built, small house or to get proper repairs made. Then, even good tenants are apt to become care-

less, and the children grow up without the love and care for the home which they should have.

The general subject of food, the necessary amount and composition per person per day, the proper preparation and the general waste of it in America are so much written about that there should be little left to say. Unfortunately one sees in print so much nonsense on the subject that it would be wise for the novice to ignore most magazine and newspaper articles and to pin her faith to United States Department of Agriculture publications and to books by real authorities. One phase of the subject which few writers touch upon, but which causes much trouble and expense in homes and institutions, is the interpretation of "one man's meat is another man's poison," as meaning that children should not be forced to eat anything they do not fancy. Granting that there are exceptional cases of idiosyncrasy which must be allowed for, it is evident from observation that children can be taught to eat what is placed before them and finish the amounts of food they have taken. If one may judge from old families which have produced well-known citizens in each generation whose members consider a well-cleaned plate a family trait, it would seem that this training is as good for character as for economy. It is surely extreme for each of five members of a family to require a different kind of breakfast food.

Mere attention to percentages of nutrients or calories of energy is not enough to prevent waste in food, unless one is catering to out door laborers whose appetites make any good food welcome. It seems to be proved now that the digestive juices are only secreted properly when the food has an attractive flavor and is "interesting." This accounts for the lack of satisfaction that is often felt when one has left a dull table even when there was more nourishing food provided than could be eaten. Professor Chittenden has shown that even dogs require variety and interest to make them digest their food—how much more human beings.

Little needs to be *said* about waste in clothing, though much remains to be *done*. Professor Marshall has said "Everyone who changes the material of her dress simply at the bid of fashion sins against the spirit of art, but she also probably adds to the wreck of human lives that is caused by the hungry pining for work." If people who wear their clothes while in style and then give them away could realize the lowering of artistic feeling and general loss of self-respect caused in the poor by wearing grotesque, overtrimmed creations when they are sufficiently

out of style to be noticeable, the said wealthy people might hesitate to wear such clothes even when they were in style.

According to the law of variety, "The ideal which the economic man should have in mind is that of carrying each kind of consumption only to the point where it becomes less pleasurable than another form of consumption that may be enjoyed at the same expense." Hence, to live reasonably a person must study his income of time and money as a whole and apportion it equitably among his needs; rent, food, clothes, culture, etc., not forgetting health and happiness. Mill says there are no laws other than those of human enjoyment, but as one looks at homes of different standards, there seem to be the greatest divergences in relation to the standard of happiness. Too many homes seem merely a tread mill with no recognition of this standard, either from the outside world or its representative, the man, who still too often considers the home as something for which he is paying and which must be run for his convenience. We are just now in a peculiar transition stage in regard to the position of women but there will be a step forward when more women fully exercise their instinct of workmanship and refuse to be merely conspicuous idlers or wastefully dressed lay-figures designed to advertise their husbands' wealth.

Much lack of happiness for household workers comes from lack of recognition. Most men have hope of advancement at some time, but what chance of it is there for the housewife? It should be made up to her in praise for successful efforts. Some men go on the principle of never mentioning the quality of a dish unless it be bad. Mrs. More in her book *Wage Earners' Budgets* gives as typical the woman whose highest praise of her husband was "He has never called me a liar, nor I him." This shows plainly the pitiful lack of joy in personal relations with sympathetic human beings. We need to remember this in our consideration of household service. A very competent, well-educated maid said, "I don't want to work in a place where there is no one to tell me my work is done right."

Everyone admits the beauty of a well-ordered life, while there are few of us who have not lamented the jarring elements in the home life of some of the world's heroes. With higher ideals and wider knowledge, cannot the housekeepers of America set the pace in the advance toward well-ordered and beautiful lives for all of us?

HYGIENE, DRESS, AND DRESS REFORM.¹

DR. DUDLEY A. SARGENT.

Like all problems in hygiene which this generation is called upon to solve, that of suitable clothing, especially for women, has gained in complexity as conditions under which we must live and work have become more involved. Just as city officials and scientists are working out schemes for better public hygiene, as doctors and bacteriologists are applying their knowledge of germ life to preventive medicine, so each individual should feel a personal responsibility in appropriating all this enlightenment and in scientifically regulating questions pertaining to personal hygiene, including dress.

The fundamental principles governing hygienic dress—such as underwear, kinds and weights of materials, supports, garters, corsets, boots, tight sleeves, and collars, remain the same under normal though varying conditions because the same great physiological laws are involved, laws which pertain to the body as a functioning machine, an active life force which strives to go on and do its work even when we maltreat the body so that it is hampered and impaired. Our motto ought to be “clothes are made for the body, not the body for clothes,” and we should by the test of usefulness and hygienic value, first, and of ornament and adornment afterwards, apply our judgment to modes of costumes. And as for reform, there will never be a radical change in dress accepted by women which renders them ridiculous, or unsuitably accoutered for daily tasks. We must look in some other direction than the bloomer costume or Roman togas for a solution of the problem. Let us not soar into impractical exhortations to the refined matron to discard skirts and go shopping in the Turkish woman’s costume, or to the business girl to drape herself for a day at the typewriter in the becoming scarfs of the Greek maidens. We have present conditions to deal with, present occupations to consider, and present demands to supply, and to do all this we must study our subject according to the laws of physiology, sociology and economy. There is

¹ Read at the Boston Meeting of the American Home Economics Association, January, 1910.

one idea which the physiologists are impressing strongly upon us, and that is the principle of the unity of the body as an organism; the principle of the interaction and dependence between one function and another. This idea is fundamentally connected with our subject at almost every point from which we may take up our discussion—as for instance, the relation of posture, and its resulting effect on internal organs, to types of support, as corsets and suspenders; or the effect of constriction of the waist or chest in impeding digestion and circulation.

Our body, then, is a functioning machine which must have heat in order to work; and the skin, with its pores, and hairs, and various glands is its real dress, and the natural regulator of our bodily temperature. But under our climatic conditions, clothes are necessary to aid this function, as well as to satisfy the dictates of modesty and fashion. We find in many of the older books on hygiene such quotations as this, "From the standpoint of the hygienist, then, clothing is intended to preserve an equable temperature about the surface of the body." When we remember that 80 per cent of our food is needed to keep up animal heat, and that 70 per cent of the loss of this heat is from the skin, we realize the necessity of suitable clothing to assist the important skin functions of holding in the heat in cold weather, and of giving it off in warm weather. These two points are the ones to consider in choosing proper underwear. As Dr. Black says,

Undergarments are the ones upon which reliance should be wholly placed for the proper protection of the body. The warmth of the body is far more efficiently retained when the protecting covering is next to it. Outside clothing should be worn to keep penetrating winds from the surface of the body, so that ventilation and radiation may go on in a normal way.

It is almost impossible to dictate in any autocratic fashion the kind of undergarments to wear, since individuals differ so radically in their needs and preferences. Still, there are laws to guide us in our choice, laws which we must heed to gain the greatest comfort and efficiency. Nature's clothing for her animals is uniform and unconstraining, varying with geologic and climatic changes in temperature. And from nature we can cite many familiar instances to demonstrate the principle that it is not the weight of a garment as much as its texture, nor the material itself as much as the manner of wearing it which constitutes its hygienic value. When pussy dozes on the doorstep in the wintry sunshine, he fluffs out his fine coat of fur and makes a loose but thick covering; when the fowls go to roost they ruffle out their feathers, and to the unthinking seemingly invite the chill of winter to penetrate

their plumage. The old farm horse that jogs into town on a market day is as furry as a toy lamb. In nature, the colder the weather, the more loose and erect the covering of fur or hair or feathers becomes. This is to ensure a protection that shall hold in its meshes layers of air, for dry air is a poor conductor of heat, and therefore the body heat of the animal is better retained. This method combines the greatest warmth with the most ease and lightness. Each layer of fur or feathers forms a wall within a wall, holding warm air between them. The Eiderdown duck, inhabiting the cold regions, has the lightest, softest coat of feathers imaginable, yet what a perfect protection it has in the air enmeshed in those fluffy strands.

The ideal texture for warmth, then, is a material which has a thick, loose, texture with fuzzy nap, such as wool; while the manner of wearing it, since it is to supplement the skin, is naturally next to it. But as already intimated, it is unwise to prescribe woollen underwear for all. Some skins are hypersensitive to the irritation of wool, while some function so vigorously that they do not need the aid of wool. And here we see the benefit of preserving the natural non-conductive quality of the skin, by keeping up its "tone" by hygienic measures such as exercise, bathing and rubbing, so that it will accustom itself to quite wide ranges of temperature and render unnecessary constant changes of underwear with every fluctuation of the thermometer. Modern science has succeeded in imitating these necessary qualities of the texture of wool in many ways. Cotton is made up with a wooly, fleecy nap, with plenty of air space in its loose texture. Cotton and wool are so combined that the side next the skin is the cotton weave, while the reverse is wool; or the two materials are mixed as in Merino underwear, softening the irritating qualities of wool. When on the other hand, we consider underclothing for warm weather, and its importance in helping the skin regulate our temperature, and keep us in a normal condition, we find just the opposite qualities from those considered are required. Smooth, thin fabrics are most appropriate, such as linen, sheer cotton and silk. To sum up, then, we can say that the virtue of underclothing may be principally estimated by the conducting or non-conducting properties of the material. A linen shirt takes warmth and moisture from the body and discharges them rapidly into the surrounding air, therefore it is a garment desirable for a hot summer day. A woollen shirt takes heat and moisture slowly from the body and discharges them slowly into the surrounding air, therefore it is a suitable garment for a cold winter day.

From these principles each one should work out her individual preferences and find the type of material best suited to her body, considering her age, vigor, occupation, and health. And let the covering be as uniform over the body as possible, remembering that if one part is overclad and another thinly covered, a lack of equilibrium in the temperature renders the organism weak, liable to colds from draughts and sudden changes, coughs from exposure, and a whole train of evils from cold, wet feet due to inadequate foot wear. City pavements and the bettered condition of country sidewalks in winter have rendered heavy rubber boots and such footwear almost unnecessary. And yet how often women go to the other extreme and appear in mid-winter in low cut, thin-soled shoes, hardly more than slippers. For warmth and protection, overshoes lined with a wooly material are the best things, and can be worn over low shoes, thus giving free play to the ankles and ventilation to the foot. The noxious rubber boots that children and adults used to wear are on the wane. Of all the cold, uncomfortable forms of footgear those certainly are the worst. Unpliable, ill-ventilated, heavy, half the time full of snow and leaking, what a protection for a child's feet! Stout leather boots, with rubbers and gaiters, if necessary, are the hygienic modern substitute.

The question of the best kinds of boots and shoes is almost exhaustless. We all know that broken arches, flat foot, weak ankles and other pathological conditions require special shoes to assist the muscles and bones, and to correct deformities. But normal feet, even when constantly in use, standing or walking, can be so clothed that the elasticity of health can be retained, and corns and bunions and such insults to our feet be unknown. To maintain such a normal condition shoes must be made on lines conforming to the shape of the foot, with a low, rather broad heel, at the heel, not under the instep, a sole sufficiently thick yet pliable, and with enough width and length to allow for expansion of the foot in standing and the action of the muscles and bones in walking. Who was it said, in choosing a pair of shoes, to find a size that fitted and then buy a size larger? This may not be necessary, and in fact too loose a shoe chafes the foot, but too tight a shoe causes miseries, and an ill fitting or foolishly stylish shoe is the cause of much of the ungraceful walking and forced unnatural body positions assumed in the attempt to maintain an equilibrium.

We can return to the thought of the unity of the body again in considering the bettered conditions for living and the resulting changes in ideals of hygienic dress. Compare the facilities for bathing, to take

but one example, that are offered in modern American homes, with the lack of such opportunities fifty years ago, and consider their tonic effect on health and influence on dressing. The crash bath towel now takes the place of the old red flannel shirt, and the change is for the better. Warm houses make heavy indoor clothing unnecessary, and therefore the skin is functioning better all the time, and more ready to respond to the stimulus of outside cold. The habit now so popular of sleeping out of doors, and with windows wide open to the dreaded night air of our grandmother's time, so thoroughly oxygenates the lungs and blood and internal tissues that great resistance to the cold is built up, and heavy, clogging clothing is dispensed with. Outdoor exercises and sports have largely freed girls and young women from sleeves so tight that they could not swing a golf stick, and from trailing skirts for daily wear. We have therefore to thank many phases of modern life, and especially practical lessons from physiology for the adaptation we can make in our dress which renders it more comfortable, light and serviceable.

It is amusing and enlightening to read in books on hygiene published some years ago warnings and exhortations on dress reform. Who does not remember family portraits of little children clad in very low neck, short sleeved dresses—a costume seen but rarely on infants now, and then only on the most torrid mid-summer days. This fashion was much decried by hygienists, but the true physiological explanation of the harm done was not shown till later, when it was found that an infant's body radiates more heat in proportion to its size than does an adult's, and that because the mother could stand the drain on vitality of such a fashion was no reason that the child could. Perhaps the greater prevalence of croup in those days may be traced to this cruel custom. Conserving the body's warmth means greater health and growth to the child. Again, we come to references to hoop-skirts, denouncing a mode of dress that holds the warmth of the clothing several feet away from the body! Then there is a lurid dissertation on the evils of tight lacing thirty years ago, depicting the pale, emaciated maiden, whose form was wasting away in her stays. Against the woman who sweeps up the filth and dust of the streets as she trails through them with dragging skirts, the authors unite in their denunciations.

Some of these evils have gone, some are on the wane or disguised, while some are still boldly displayed. But in regard to them all, those who urge reform do so on authority which was not to be had even a

few years ago, the authority of scientific research, careful deductions, and keen knowledge of physiological laws. There is less reason than ever, now that this knowledge is so freely given her, for woman to moan that she "was born to suffering." To quote Dr. Black again,

Nature's gifts are invariably adequate and complementary. She never makes a requirement for which there was not *originally* sufficient provision. All the insufficiency observed is of *art* not of *nature*. In the air breathed; in the sunlight absorbed; in the exercise taken; in the clothing worn, women are far more the child of vicious art and custom than man. Until they purge themselves of these evils, take adequate outdoor exercise, and protect their bodies with clothing more in accordance with the requirements of nature, their plea that they are born to greater suffering than men, will have only an apparent foundation of truth.

As has been said, the economic conditions of woman's life at the present day are utterly unfavorable for a return to classic, medieval or oriental modes of costume. She must work out her dress reform in relation to the demands of living. We have shown how some of the hygienic conditions are favorable to this reform, and there are still others of a more economic nature. Better and cheaper materials are constantly being manufactured; ready-made dresses, which save the busy woman hours over her needle, are available from reliable shops; boots and shoes are made on more hygienic lines, if she will but avail herself of these models; the greater variety, better make and fit of corsets, underwaists and supports make it possible to find a garment which will not injure her physique, if she will but train her muscles to do their normal work in support and poise. Improvement in dyes in stockings and stuffs render poisoning from that source very uncommon, while the remarkable popularity of the light weight walking skirt, and the comfortable shirtwaist, make it a *moral* obligation of every thinking woman to avail herself of the best which her generation offers, and show forth her life in all its efficient strength.

Dress reform, in other words, must start in intelligent understanding of, and in sympathetic conformity to, the present age, without sacrificing principles of good health. As in all reforms, in religion, in education, or in dress, some elements of the truth are always with us. We can never reach a perfect system, because higher demands and higher ideals are constantly developing as we force a wider opening in the crack through which we "see darkly" into the mysteries of body, mind and spirit. The elements are here, then, in the form of the hygienic and economic conditions already mentioned. It is the duty of those who recognize these opportunities to create a demand for them,

for the human race is a great deal like children, they do not know what they want until they see it. But if the right ideal is constantly held up for women to see, they will, slowly perhaps, begin to want it. The suffragettes are working on this principle, keeping before their women-kind ideas of equality and social progress until women shall *want* them, heart and soul. The true "woman's rights" are rights to good health and strength, and a release from conditions that restrict her bodily as well as her social development.

There is everything to be said in favor of the fashionable "one piece dress" provided the undergarments, especially the corsets, if worn, are properly made. Such a costume gives great artistic unity to the figure, does away with awkward belts and untidy waistlines, and permits ease and grace of carriage through the equal distribution of the weight of the garment. But this fashion *caricatured*, or carried to an extreme, as it so often is, negatives the very points it ought to emphasize. The corset is worn to impale the legs and flatten the back, the waist is constricted, and the beautiful unity and strength of the trunk is broken. Often the bust effect is over emphasized, especially on slender women, and combined with the popular high heels, the whole effect of the balance and poise of the body is thrown out of gear. This is what happens to a good style in the hands of the ignorant, and it remains for dressmakers, tailors and department stores to see to it that they create a demand for the right rather than the wrong type of this fashion. The high-waisted fashion of last winter suffered a similar fate in the hands of its maltreaters, its caricaturists. Instead of giving soft, free lines down from the raised waist, tightly fitting underslips were almost universally worn to maintain the "figure," and more than often the outer skirt was of the same tightness, necessitating the long corsets, and producing a painful "willowy-ness." The overskirt style now in vogue seems to be tending to swathe up the thighs. Kind modistes, forbear to draw the loops more tightly, lest we go mincing along like wound up toys!

Dr. Joel E. Goldthwait, in a recent article in the *Medical and Surgical Journal* has clearly and convincingly demonstrated the relation between poise and bodily efficiency, showing how the relative positions of the internal vital organs are maintained under the normal conditions of an upright posture. Such a maintenance means the well-being and efficiency of the organism, while the disturbances caused by faulty attitudes due to weakness, carelessness and willful perversions of fashion, mean sickness and loss of vitality. His study of two popular types of

corsets is particularly significant. The old straight front model, he concludes, was, for all its faults, better than the present flat-back model. The former, while increasing the natural inward curve of the lower back, nevertheless preserved the natural protection afforded to the pelvic organs by the shelf-like projection of the sacrum, and also maintained the forward downward tip to the pelvis, so necessary, as he shows, in keeping the delicate pelvic organs in the pockets of protective muscles and fat designed for them. This style also produced a hyperextension of the upper spine to counteract the increased curve below, and this caused a beneficial expansion of the chest aided by the freedom of the low cut of the corset. But with the "flat back" type these conditions are reversed; the natural lumbar curve is destroyed, and the pelvis, tipped upward and backward, is deprived of its natural protection, the sacral curve. In such a position the weight of the abdominal organs tends to rest on the pelvic organs, causing painful displacements and nervous symptoms. In addition, the upper curve of the back is thrown more forward, to keep from falling over backwards, and consequently the shoulders are rounded and the chest flattened. The strain on the body resulting from such conditions prevents its doing its most efficient work.

Nature has a distinct architectural plan in building the body, and it is imperative to choose such a form of corset as will not interfere with this plan, and which will not, through ignorant and perverted tastes, make of you a "wasp," a "trussed fowl," a "stuffed goose," a "weasel," or any other kind of an animal. If you cannot by good health and exercise train your muscles and bones to support your bodies; if on account of over development, sagging abdomen, and clumsy hips some restrictions are necessary, choose those forms which will have a corrective tendency rather than those which will merely increase your deformity. A pliable waist will keep the figure in shape without constricting it, and will give the muscles an opportunity to recover their tone. For we know that if we delegate to any form of corsets or brace the duties which should be done by the muscles, they degenerate and depend wholly on the support.

Dress reform! Do not let it call up a vision of short hair, knee skirts, and high laced bicycle shoes; nor yet of mannish cravats, and severe coats and shirts. There need be no such radical changes, nor any perceptible departure from a womanly, becoming, nay, even frivolous costume. The peripatetic waist-line, as variable as the isotherms of the temperate zone, can still move up and down, but don't let the internal organs be moved along with it! Keep the body itself right and upright, clean and vigorous, free and strong, and reform will have been gained.

THE HOUSEHOLD ARTS BUILDING, TEACHERS COLLEGE, COLUMBIA UNIVERSITY.

The School of Household Arts, Teachers College, Columbia University, has recently occupied its new studio and laboratory building, and some account of the equipment of this university technical school for women will be of general interest.

The building joins the main college building on the east, and is 160 by 60 feet in ground area, six stories high, with 80 rooms and a floor area of an acre. It is devoted exclusively to the purposes of the School of Household Arts. The basement, which is quite above ground, contains the laundry, laboratory, a large laboratory for practical courses in household administration, and a testing laboratory and locker room. On the first floor are offices and lecture rooms, and the household and industrial arts reading-room, for which a special library of several thousand volumes is in process of formation. The department of foods and cookery occupies the second floor, with three large cooking laboratories, besides an institutional cooking laboratory, an experimental cooking laboratory and a table service laboratory. The third floor is occupied by the department of textiles and clothing, with four large laboratories for sewing, dress-making and millinery. On the fourth floor are located the departments of household chemistry, physiological chemistry, and nutrition with five large laboratories. Additional science research rooms are on this floor and the floor above. The fifth floor contains three household art studios, the textile studio, the nutrition research rooms, and a demonstration apartment of six rooms. Above all is a roof garden 100 by 25 feet in area which promises to be a useful adjunct to the building.

One of the more unique features of the building is the institutional cooking laboratory which forms an integral part of the equipment in the department of foods and cookery. This laboratory, with the adjoining table service room, provides equipment for practice work in the preparation and service of luncheons and other meals to groups, so that the student may receive practice in handling food in large quantities both as regards marketing, preparation and service. The

large quantity apparatus includes units which repeat all the essential parts of the equipment in a hotel or an institutional kitchen. There is a unit French range and a unit gas range, of the types used in hotel kitchens, and in the block with these, charcoal and gas broilers, a steam soup kettle, steam vegetable cooker, steam-table for service, plate warmer, urns and other equipment necessary to complete the installation. The table service room adjoining this large-quantity apparatus is perhaps the most attractive room in the building; it is finished in high carved oak panels decorated with the linen fold design. The room can be arranged either as a family dining-room, with a center table, or as a café or lunch room accomodating forty persons. One problem upon which the department of foods and cookery is now engaged utilizes this room with a service of luncheons one day a week with varying prices.

Another feature which attracts general attention is the laundry laboratory which possesses complete equipment both for hand and machine work. The hand equipment includes fixed tubs, ironing tables and other necessary apparatus. The power equipment includes a wash wheel, centrifugal extractor and mangle, all electric driven, and a steam drying-room, with starch kettles, work-tables and other modern equipment. This laboratory is finished in white tile flooring and wainscoting, and with a class busy upon snowy linen, forms a most attractive sight. This course has already attracted a large registration in domestic laundering and a full class in the conduct of institutional laundries.

The registration in courses which prepare for teaching domestic art and domestic science, the long established divisions of Home Economics at Teachers College, has notably increased this year. There are seventy-seven candidates for the domestic art diploma and one hundred and forty-eight for the domestic science diploma. The newer departments have the following registration: Nurses education, seventeen; household administration, fifteen; and house decoration, one. The domestic art and domestic science curricula were each enlarged during the past year, both in technical and educational courses. The domestic science course has been strengthened by a broader offering in food chemistry and dietetics, and the domestic art course by new courses in costume design. Both curricula now include a new and distinctive course in laboratory methods and practical class room technique. The members of the class discuss details of laboratory management and equipment, and in some cases are given lessons as

if they themselves were children. These courses furnish, therefore, laboratory practice in the topics discussed in the courses in educational method. The experiment has met with very satisfactory results. There are also six graduate students registered for the degree of Master of Arts in domestic science, and one in domestic art. The trade diploma offered by the domestic art department is also attracting women who wish to prepare for positions in trade schools. There are unusual opportunities for those who know the details of trade work and are willing to secure proper preparation for teaching technical subjects.

The offering of the School of Household Arts for next year is considerably increased over that of the present year. Some fourteen new courses are to be given and several new diplomas which have been taking form during the present year, are definitely provided. These round out the instruction of the school as a professional school of university rank for women students, parallel to the professional schools of law, medicine and engineering for men. New curricula are provided in household and institutional administration, in dietetics, in house decoration, in nurses education, and in visiting, nursing and health protection (designed not only for graduate nurses, but also for college women with previous training in biology and chemistry, in preparation for positions as board of health assistants and sanitary inspectors). Another departure is a two-year curriculum for high school graduates, leading to a diploma in applied arts, which is to include cultural subjects, but gives major emphasis to vocational subjects of a practical nature selected from the schools of household arts, industrial arts, fine arts, music and physical education. This applied arts diploma provides a new type of college study for the first two years of a four-year course. It retains the central cultural subjects of regular college course and provides for electives in practical fields which will be of direct value to the young woman as regards professional service or later home life. It gives a well rounded training to that type and temperament to which the classical college course does not appeal, a preparation in one way complete in itself and in another forming a very adequate introduction to later professional preparation for teaching, administration or public service. Another new curriculum is the one-year training in fundamental science and the household arts, including also elementary materia medica and principles of nursing, provided for young women who wish to

enter training schools for nurses, and for which credit can be obtained in reducing the period of training in the hospital.

With its other activities, the School of Household Arts has offered this year a score and more of extension classes which have attracted upward of 400 part-time students, in addition to the 258 students in residence. Besides courses in cooking, dressmaking and the other usual subjects, useful classes have been formed in marketing, care of infants and small children, demonstrations in carving, and one successful housekeeper's conference has been held.

The response from the public in New York, and from the country at large, indicates that the School of Household Arts at Columbia University will, with similar institutions elsewhere, perform a large service for the common good. As one enters the new building, one passes mural decorations which represent woman's traditional domestic industries—weaving, cooking, sewing, candle-dipping, and churning; what one meets within the door expresses the hope of the future.

JOHN STANTON GOULD: A PIONEER STUDENT OF INSTITUTION DIETETICS IN AMERICA.

C. F. LANGWORTHY, PH D.

U. S. Department of Agriculture.

John Stanton Gould, who published in 1852 the results of an extended study of dietary and other conditions in public institutions in the United States, was born in 1811, and died at his home in Hudson, N. Y., in August, 1874, in his sixty-fourth year. He was a member of the Society of Friends. In his youth he received a very thorough education, particularly in the physical sciences, and throughout his life was well known as an industrious student and a writer and lecturer on scientific topics. At the time of his death he was a non-resident professor of Agriculture at Cornell University, a position he had filled since 1869. He had an admirably conducted farm in Columbia County, N. Y., and took an active part in movements for agricultural improvement. For many years he was a member of the State Agricultural Society and its president in 1866. He was a frequent contributor to the agricultural press and interested in politics and in general in public questions. As an example of his writings on agricultural topics may be mentioned his paper on forage crops prepared for the New York State Agricultural Society,¹ which is an exhaustive discussion of the subject from a botanical and chemical as well as from an agricultural standpoint.

Data supplied through the courtesy of Prof. Burt G. Wilder of Cornell University give an idea of Professor Gould's personality and point of view. He states that at a memorial meeting held in honor of the elder Agassiz the 28th of May, 1874, Professor Gould presided and made the principal address. The following statements which he made regarding Agassiz and his power of imparting scientific information in such a way as to prove really useful, without doubt express his own ideas of what is best:

It was not merely men of science that he was ready to devote time and attention to. I have seen plain farmers who did not know the difference between oxygen and

¹Trans. N. Y. State Agr. Soc., 32 (1872-1876), pp. 1-90.



JOHN STANTON GOULD.

hydrogen, and who scarce knew the difference between a vegetable and a mineral, go to him to elucidate some point upon which they were puzzled. It was beautiful to see that illustrious man sit down by the side of these simple men, and teach them just what they wanted to know in the plainest and simplest language that could be imagined. He would select such happy phrases, with such adaptation to the intellectual and scientific wants of the person he was addressing as to exactly convey his idea.

Prison reform was a subject in which Professor Gould was very much interested and for many years he was one of the directors and executive officers of the New York Prison Association.

In 1850 the Board of Commissioners of Immigration reached the conclusion that additional information was needed if they were to meet intelligently the great demands which were being made for assisting the immigrants who were coming in large numbers to the United States and who needed, at least, temporary housing and shelter, particularly for purposes of quarantine. They decided, therefore, "to procure a suitable agent to visit the best institutions in our country, who should study the system of management pursued in each, and also seek information in relation to the cheapest and most nutritious kinds of diet, with the most economical processes for their preparation."

Knowing that Professor Gould's attention had been turned to these subjects for many years, the commissioners invited him to collect this information but he was unable to do so at the time and as no other suitable person was available, the project was abandoned. However, the next year when under the joint auspices of the board of commissioners of immigration and the board of governors in the New York Almshouse department it was revived and his services again sought he consented to undertake the work. That he was well qualified for the task entrusted to him, the report which he submitted to the commissioners bears witness. It bears the title: *A Report of Food and Diet, with Observations on the Dietetical Regimen, Suited for Almshouses, Prisons, and Hospitals; Also on Heating, Ventilation, etc., with Practical Recommendations*, and was published in New York in 1852 by joint resolution of the two boards.

As a necessary part of his investigation Professor Gould made an extended study of the writings of Liebig, Megandie, and other writers on food physiology, and related questions, as well as of work on institution management. His summary of physiology as related to food matters and general data regarding nutrition problems is of interest as it undoubtedly gives an idea of the views which were held at the time.

The contributions of men of science to the solution of alimentary questions, he writes, may be summed up as follows:

The body is continually wasting its substance. Food is necessary to repair this waste. Food is also necessary to support respiration, and to sustain animal heat. The food must be sufficient in quantity and quality to repair the waste of the organs and tissues, and to sustain animal heat.

The higher the external temperature is maintained, the less food will be required within certain limits.

All the organs and tissues are elaborated from the blood. Therefore our food must contain all the elementary principles of the blood. The chief organic element of the blood is nitrogen. The chief supporter of the heat is carbon.

The wasted organic elements are evacuated in the feces, the urine and the sweat; the sum of the nitrogenized compounds contained in these shows the sum of the same compounds which must be received in the food.

Since oxygen and carbon unite in uniform proportions to form carbonic acid, the amount of oxygen absorbed into the system is a measure of the quantity of carbonaceous materials which must be received in the food.

The objects of the investigation which he conducted in almshouses and other public institutions, as stated by him, were to determine:

(1) What is the least amount, and what is the cheapest kind of food by which a prisoner or pauper can be supported so as to preserve his health and strength.

(2) By what process of cookery can the nutriment in any given kind of food be most thoroughly extracted.

(3) To ascertain what collateral circumstances influence either favorably or unfavorably the digestion and assimilation of food.

(4) To ascertain the relative values of all the usual varieties of aliments, with view to the establishment of a scale of dietetic equivalents. For example, if a given number of ounces of beef will support a man in his full vigor for twenty-four hours, how many ounces of mutton, pork or potatoes will support him in equal vigor for the same time, or how much of rice, peas or beans will be equal to a pound of potatoes in health and strength-giving-properties.

(5) The most effectual means of preventing peculation and waste of food in large institutions.

(6) To ascertain the influence of the various modes of warming and ventilating and the effect of different trades and occupations on the health and longevity of prisoners and paupers.

(7) To ascertain the most profitable means of employing paupers and prisoners consistently with their health and well-being.

(8) To learn any other economic or hygienic improvement in the various institutions of the country which might be profitably applied to the institutions under your care.

To sum up the whole matter, it was my intention to learn how prisoners and paupers could be supported, with the least burden to the community, and with the greatest benefit to themselves.

In carrying out his investigation, Professor Gould apparently visited all of the following institutions and perhaps several others: Emigrant Refuge, Ward's Island, N. Y.; Nurseries, Randall's Island, N. Y.; New York Almshouse; Penitentiary, Blackwell's Island; Philadelphia Almshouse; Moyamensing Prison, Philadelphia; Eastern Penitentiary, Philadelphia; Philadelphia House of Refuge; Maryland Penitentiary; Baltimore Jail; Baltimore Almshouse; Washington Jail; Penitentiary of the District of Columbia; Washington Asylum for the Poor; Boston Lunatic Asylum; Boston House of Correction; Boston Almshouse; Massachusetts State Prison; House of Industry, Boston; Suffolk County (Massachusetts) Jail; Rhode Island State Prison; and the Providence Almshouse. Data were also summarized regarding U. S. Army and Navy rations and information quoted at length from the extended study made in Great Britain of the Pentonville prisoners, which was carried on some years before Professor Gould's own investigation was undertaken. In the American almshouses and other public institutions studied, information was collected regarding the kinds and amount of food served; the bills of fare, the way in which the foods were prepared, and other related matters, and the data thus gathered are discussed at length.

According to Professor Gould's summary, the cost of provisions per week ranged in the different institutions which he visited from 28 cents per person in New York State Prison to \$2.07 in the Boston House of Correction, and the total weekly expenses per person from 70.2 cents in the New York Almshouse to \$2.98 in the Washington Penitentiary. As might be expected the materials served varied greatly in the different institutions but in most cases the breakfasts and suppers were very simple and the dinners more generous.

Professor Gould concludes that the New York institutions compared favorably with those which he visited in other cities and towns and he states that therefore it was not possible for him to suggest many improvements. He states further that the New York institutions were characterized by economy, cleanliness, comfort, and good order, and that the suggestions which he made, on the basis of his extended study of the subject, had to do more with matters of detail than with general recommendations.

It is interesting to quote the weekly bill of fare which he recommended for the Ward's Island Emigrant Refuge as it not only shows what he on the basis of his investigations, considered desirable, but

also gives an idea of food customs of the period as they were reflected in dietaries in public institutions.

Breakfast—Half pound Graham bread, one herring and rye coffee.

Supper—Four times a week, mush and molasses (five ounces of indian meal and half gill of molasses; three times a week rice and molasses (four ounces of rice and half gill of molasses).

Dinner—*Sunday*, rice hash (three ounces of meat and four ounces of rice to each person). *Monday*, baked pork and beans, five ounces pork, and five ounces beans to each person. *Tuesday*, six ounces corned beef, eight ounces of potatoes, twelve ounces corn bread. *Wednesday* [*Thursday* and *Saturday*], six ounces fresh beef made into soup, twelve ounces of corn bread, and eight ounces beets, carrots, or turnips. *Friday*, four ounces salt fish, twelve ounces potatoes, and twelve ounces corn bread.

Professor Gould compiled data published by Liebig, Prout and Pereira, regarding the composition of foods, and, in accordance with the custom of investigators at this time, on the basis of such data he calculated the amount of nitrogen and carbon furnished by the dietaries which he studied. According to his results, the weekly bills of fare in the different institutions supplied per person per day from 9.23 ounces nitrogen in the case of the Boston Almshouse to 22.26 ounces in the case of the Blackwell's Island Penitentiary, and 58.58 ounces carbon in the case of the Washington, D. C., Almshouse to 124.16 ounces in the case of the Massachusetts State Prison.

On comparing of these elements [nitrogen and carbon as he calculated that they were supplied by the different diets], it will be seen that there is a tolerable approximation to uniformity among the almshouses, and among the prisons, and a wide difference between the almshouses and the prisons, the diet in the latter being much fuller than in the former.

It is of course an easy matter to compute from Professor Gould's recorded estimates regarding the nitrogen content the amount of protein which the dietaries supplied. Unfortunately, it is not possible to compute the fat and carbohydrates from the values given for the carbon content. However, in some cases it would be possible from the recorded data regarding kinds and quantities of food served in the public institutions to compute in the terms commonly used at present time the nutritive value of the rations supplied should this seem desirable for comparison with later work.

The characteristics of potatoes, rice, wheat flour, corn meal, and other staple foods which were used in the different institutions are discussed in the report as well as the proportions in which different

foods might be used to replace each other in the diet. This was one of the subjects on which Professor Gould regretted that he could not secure more adequate and accurate data. As an example of the practice in institutions regarding the substitution of one food for another the following data which were obtained from the warden of the Eastern Penitentiary in Philadelphia are of interest:

The beans, rice and hominy, etc., are served alternately, and have been resorted to as a substitute for potatoes during the late and present high price of that article. When abundant, or not over 50 cents per bushel, we serve them nearly every day at dinner, varying by an occasional mess of beets, parsnips, turnips etc. We do not use indian meal in any other form than hominy, and that once a week.

The importance of good methods of cookery was recognized as well as the need for instruction in such matters.

For the New York Institutions Professor Gould makes the following recommendations:

Four or five classes of ten each, should be selected for experiment on the effect of various diets and modes of cookery. I recommend that the object of the first set of experiments should be, to ascertain how far the tables of dietetic equivalents founded on the relative amounts of nitrogen and carbon in each article of food, as determined by chemical analysis, can be relied on as a guide in practice.

He also devoted a great deal of attention to the study of methods of cookery in the different institutions which he visited and from Doctor Bell of the McLean Lunatic Asylum at Boston secured interesting data regarding an experimental study of the yield of bread from different brands of flour. In his report Professor Gould discusses bread making at length and gives full directions for mixing, kneading, and baking.

It is invariably true, [he writes] that the excellence of bread will be in the exact rates of the weight obtained from a given quantity of flour. The excellence and the nutritive properties of flour depend very much on the amount of gluten it contains; and it is found, on analysis, that different kinds of wheat vary greatly in the amount of this substance contained in them.

From what has been said, it appears that the conditions on which the making of good bread depends, are as follows:

First, Flour rich in gluten and sugar; second, lively yeast; third, the temperature of the sponge should be kept from 68° to 77° F.; (fermentation will not go on below 60° and a temperature higher than 120° F. arrests it); fourth, thorough kneading, care being taken not to break the dough, since that permits the escape of the gas; fifth, to check the fermentation by baking before the development of acetic or lactic acids commences; [and], sixth, if these acids are accidentally formed before baking, to neutralize them with soda or some equivalent alkali.

In view of the great interest which had been aroused a few years before by Dr. Sylvester Graham regarding coarse breads, it is not surprising to find that Professor Gould believed that they were especially worth the attention of the managers of public institutions. He also directs attention to the value of corn bread and to bread made from rye flour and corn meal.

As regards economy with respect to bread, it was his general conclusion that it was cheaper to bake bread in an institution than to purchase it ready baked.

In connection with his work Professor Gould endeavored to collect data regarding the gains and losses in weight of inmates of public institutions, as he realized that this was a matter of importance in judging of the adequacy of the diet. In only a few cases, however, was he successful as such records were not generally kept.

Professor Gould realized the important relation between the kind and amount of food and the amount of physical work performed. This fact may be gathered from his recommendations regarding the rations in New York public institutions. He says in this connection: "For the almshouse at Blackwell's Island, I recommend for non-working paupers, the same bill of fare as already laid down for Ward's Island. For working men, an addition of 33 per cent on all articles except bread for dinner."

He pointed out the dangers of resorting to poor and inadequate diet as a primitive measure and in this connection cites data included in an early report on prisons.

"We are told [he writes] that in 1822, the directors of the Millbank Prison, containing eight hundred prisoners, in compliance with a popular demand for severe punishments, reduced their diet to eight ounces of bread per diem, and a soup made in the proportion of one ox head to every hundred male prisoners, and the same to one hundred and twenty females. This amount of food, for one week, gives 20.41 ounces of carbon and 3.24 of nitrogen."

"A general decay of health was apparent, but the scurvy did not appear till January, 1843. The cases of disease increased rapidly, and on the 28th of February, 118 were sick, and on the 10th of April, more than 400."

Professor Gould's appreciation of the importance of a proper relation between nitrogenous and non-nitrogenous foods is shown by his commentary on the above, for he states that he had no doubt that these prisoners "might have kept in tolerable health, even with this

small supply of nitrogen, had the supply of carbonaceous food been increased sufficiently to supply the waste from respiration."

Professor Gould was a believer in system in public institutions, as is evidenced by his recommendation for "the enactment of code of a regulations for each institution, to be printed and placed in the hands of each person employed, in which the duties and responsibilities of each officer should be distinctly laid down, and specific directions given for their conduct in various emergencies."

He also advised "that a book should be kept at each institution, in which the following facts should be registered in parallel columns: First, name of pauper or prisoner; second age; third, height; fourth, weight on admission; fifth, occupation before entrance; sixth, occupation after entrance; seventh, capacity of the chest; eighth, weight on the first day of every succeeding month."

The importance of sanitary conditions was fully recognized by Professor Gould and quotations follow from his discussion of hygiene and its important relation to public institution problems.

The breathing of pure air is one of the first and most indispensable conditions of health and vigor. . . . Cleanliness of the person is of the utmost importance for the preservation of health. . . . Exposure of the surface to the direct rays of the sun, is another of the conditions on which health is preserved. We are unable to explain the rationale of the sun's action, but we know that the rays of the sun are capable of inducing intense chemical action, and it is probable their presence is able to determine some of the wonderful processes of vital chemistry on the action of which the integrity of the system depends. . . . Care should be taken, that the food is sound and wholesome.

As a whole Professor Gould's investigation is one which would be a credit to any investigator since it shows an appreciation of the factors involved and their relation to each other and to the general problem. Moreover, it is characterized by a thoroughness and attention to detail which is remarkable. Particularly noteworthy is the mental attitude of the observer. No detail of kitchen management is too small to arouse his interest and, indeed, the most marked characteristic of the report is that it so clearly shows that "inquiring mind" which is a prime requisite in any investigator.

It is a proof of the value of his report that it is useful to students today not only for the data which it supplies regarding conditions as they existed in public institutions in the United States more than fifty years ago, but also because it so intelligently discusses institution management with relation to food and other conditions, and supplies so much which is of permanent value.

ADELAIDE HUNTER HOODLESS.

Born February 27, 1857; died February 25, 1910.

Adelaide Hunter was born on a farm near St. George, Ontario; she received her schooling in St. George, and in 1880 married John Hoodless of Hamilton, Ontario.

In 1891 she became interested in the Hamilton Young Women's Christian Association work and especially furthered its efforts to teach girls better methods in household affairs. Under her presidency the Hamilton Y.W.C.A. opened the first public school domestic science classes in Ontario, and in 1900 established the Ontario Normal School of Domestic Science and Art in the same city. Meanwhile in 1894 she laid the claims of household science before the National Council of Women in an able speech, and was made chairman of its standing committee on household science. This office she held until 1901 and through it was connected with the development of household science in every Canadian province which has taken it up.

In 1897 she helped the women of Stoney Creek, Ont., to organize a club which developed into the Women's Institutes of Ontario, and gave them their motto "For Home and Country." In 1894, too, she carried her visions and plans and services to Hon. G. W. Ross, then Premier of Ontario, and to such good purpose that Ontario is today the banner province in Home Economics. For many years she was unofficially attached to the Department of Education, gave it loyal service in the cause which lay nearest her heart, and became a recognized authority on woman's training for the home, in both Canada and the United States.

In 1901 she carried more visions to Montreal with the result that Sir William MacDonald built and equipped two buildings at the Ontario Agricultural College at Guelph—Macdonald Institute and Macdonald Hall. She was a member of the institute staff and lectured regularly to her "Macdonald girls." Recently her interest embraced industrial education for girls, and she died while speaking on the subject to the Toronto Women's Canadian Club.

Mrs. Hoodless believed that "no higher vocation has been or ever can be given to woman than that of the homemaker and citizen builder,"

and she was an able and persuasive advocate of her belief. In the midst of her own rich and full home life, she did noble pioneer work for homemaker education in Canada; its present development is in large measure due to her tireless promotion of its claims and the scope of her ideals; and she laid her work down in the middle of plans for its greater development.

In the Home Economics Association where, as in all similar organizations, the members find mutual inspiration in social contact as well as in serious conference, Mrs. Hoodless' attractive personality will be greatly missed.

MARY URIE WATSON.

A MODEL FOR BRANCH ASSOCIATIONS OF HOME ECONOMICS.

We reprint below a copy of the circulars, recently used by the New England Home Economics Association as they furnish an excellent model for the formation of such branches.

The chairman, Miss Sarah L. Arnold, has furnished a few words of introduction.
—ED.

The organization of the American Association has paved the way for smaller groups which can not only do effective work in the various centers, but can derive great advantage from such association.

We found a ready response to the circular calling for the New England Association. Teachers in public schools and in private schools, settlement workers, housewives, and others interested in general education or in social work made up the company which assembled at the first meeting. It was evident that we had general common interests, and that at the same time each placed special emphasis upon some one phase of the work. It was therefore deemed wise to arrange smaller conferences for the study of specific questions. This would maintain the enthusiasm and interest of individuals, would occasion informal meetings, and supply material for larger conferences.

The response thus far has been generous and enthusiastic. We hope soon to make a more definite report of progress.

Even in its youth the Association has served as host to the American Association at its recent meeting in Boston. This meeting proved of incalculable benefit to the younger and affiliated association. Already the experience of the New England Association leads us to believe that the organization of such groups, however small, in many sections of the country would increase the enthusiasm for the cause and provide many advantages for the individual members—SARAH LOUISE ARNOLD.

[Reprints of the Circulars.]

NEW ENGLAND HOME ECONOMICS ASSOCIATION.

Chairman.

MISS SARAH LOUISE ARNOLD,
Dean of Simmons College,
Boston, Mass.

Secretary-Treasurer

MISS ISABEL F. HYAMS,
26 Wales Street,
Dorchester, Mass.

MEMBERSHIP NOTICES

The New England Association of Home Economics hopes to include in its membership all New England men and women who are interested in raising the standard of home life and in extending the knowledge of Home Economics. The membership fee is fifty cents. This entitles the member to join conferences and to attend all meetings of the Association.

Will you not become a member and ask a friend to join the Association? Enclosed are membership forms which may be sent with stamps or with a check to the Secretary of the Association, Miss Isabel F. Hyams, 26 Wales Street, Dorchester, Mass.

The next meeting of the Association will be held at the Institute of Technology, corner of Clarendon Street, 525 Boylston Street, on Saturday, December 11, at 3 P.M. Subject, Home Economics as a Social Force. The meeting will be addressed by Miss Alice Higgins, Agent of the Associated Charities of Boston and Miss Winifred Gibbs, Agent of the New York Association for the Improving of the Conditions of the Poor. If time allows, the claims of the housewife will be presented by a member of the Association.

Mrs. Richards will present plans for the reception of the American Association. *You are invited to attend the meeting.*

MEMBERSHIP BLANK NEW ENGLAND HOME ECONOMICS ASSOCIATION.

Please enroll $\begin{cases} \text{me as} \\ \text{us} \end{cases} \begin{cases} \text{a member} \\ \text{members} \end{cases}$ of the New England Home Economics
Association. $\begin{cases} \text{I} \\ \text{We} \end{cases}$ wish to join the following conferences
 $\begin{cases} \text{I} \\ \text{We} \end{cases}$ enclose \$ for membership dues beginning

Name.....
Address.....
Position.....

PLAN FOR CONFERENCES

It has been suggested that the New England Home Economics Association should be divided for specific work into conferences. Each conference would be made up of members who express a desire to study some particular problem. These conferences would be under the direct leadership of a chairman, would meet at such intervals as they might wish, and have independent plans for investigations, study, or simple conference. There would be no limit to members. A small group, for exam-

ple, might confer about a tea-table, while larger groups might gather more formally to discuss a matter in which they are interested. The chairmen of the conferences may be called upon to report at the general meetings.

The following conferences have been suggested. Please indicate your choice of one or more in returning your application for membership.

- (1) Public school programmes in Home Economics.
- (2) Home Economics in social work.
- (3) Domestic service.
- (4) Home Economics for the housewife.
- (5) Home Economics in higher education.
- (6) Sewing and associated handicrafts.
- (7) Study of dietaries.
- (8) Rural schools.
- (9) Institutional management.

The conferences will be completely free to elect their own chairman and to plan the methods of any undertaking which they may devise. Other subjects for conferences may be added.

EDITORIALS

In the rapid development of the past ten years Home Economics seems to have reached the stage where the need of specialization is felt. During the Boston meeting this was several times emphasized and a section devoted to study of problems of household administration and institutional management was suggested.

Conference on Household Administra- tion.

These annual meetings are now on such broad lines that it becomes essential to reduce the experiments and experience of many workers to compact form for discussion.

The trustees of the Lake Placid Club cordially invite such a section to hold its first meeting at the club the latter part of June and offer club facilities for the study of such problems as they may serve to illustrate. A week spent together where discussion and comparison can go on quietly, without the distractions and confusion of city life with its divided interests, should count much for progress. There were only seven, outside of club residents, who came together to organize the Lake Placid conference on Home Economics in 1899, but results seem to have justified the effort.

Those who would like to coöperate in this work are asked to write direct to the editor of this department (Mrs. Melvil Dewey, Lake Placid Club, Essex Co., N. Y.) suggesting subjects of immediate interest for discussion at this first meeting. It may be wiser to concentrate on a few lines of work at present without attempting to cover the broad field. Programs will be mailed to all who send addresses.

An interesting development in the Home Economics field is the large number of association meetings in many states of the Union.

**Branch
Association
Meetings.** Some of these are held in connection with an organized body, such as a state teachers' association. Sometimes, again, it is a meeting at a university in combination with some woman's club. Reports of a few

of these gatherings are given elsewhere in this issue, but the *Journal* would like to publish a full list of such meetings. It is therefore earnestly requested that reports be sent to the Editor of the Education Section, 525 West 120th Street, New York City.

Papers now in preparation for the October number of the *Journal* on methods of teaching in domestic art will mark the beginning of a series of articles on methods of teaching in the different departments of Home Economics. If they prove helpful and arouse discussion, this form of presenting the subject will be continued in future numbers. The topic is one of vital interest to a large number of the readers of the *Journal*. The editor of the education section would welcome questions and reports of experiences, for we need an exchange of opinion in regard to practical details of method and classroom management and suggestions from many sources. Exact uniformity in the teaching of this subject is not desirable and would certainly be impossible in a country where conditions are so varied; but open discussion offers one method of raising the standard of teaching. We need to see how the best pedagogical principles may be applied to the various household topics, each topic and each lesson being made the subject of careful study.

We are not claiming too much when we say that Home Economics is now an assured subject in the educational world. The struggle for recognition is over; but this is no time for us to rest upon any laurels that we have seemed to win. We now need to work on the development of courses of study which shall be effectively related to the curricula of the public school, the vocational and industrial school, and the college. Above all we need to appreciate the necessity for the careful management of recitation and laboratory work.

It has been said by more than one educator that the household arts are among the most poorly taught subjects in the school. This criticism must not be accepted or rejected without thought. The subject has now for a few years been so prominently before the public that its defects of necessity stand out, while those of other subjects are for the time partially forgotten. The youngest of the group has been, moreover, the first to receive the brunt of discussion which has resulted from the development of new pedagogical ideas that will in time affect the teaching of all branches in the curriculum.

We must also admit that the standard of teaching in these branches has doubtless suffered in the last few years from the fact that the call for instruction in all classes of schools has increased so rapidly that the supply of well-trained teachers has been wholly inadequate. Many teachers have thus been thrown on their own initiative in new fields who but for this pressure would have had longer discipline and experi-

ence in normal or graduate work before attempting to fill independent positions. For the same reason there has been too little opportunity for a strict grading of instruction. The lines have not been clearly drawn between elementary, secondary and collegiate courses.

In meeting these difficulties the teachers of Home Economics have done some of the noblest pioneer work anywhere on record, and the same spirit will enable them to meet the demands of the future.

What are some of the fundamental facts that we need to appreciate in order to raise the level of teaching? Teachers often fail to recognize that they are dealing with a body of ideas, so many in number and so vital that there is an embarrassment of riches. We are in danger of losing ourselves in the practical detail. It seems more difficult in the field of home work to realize the vital relation between theory and practice than in any other industry or occupation. In agriculture, an occupation most closely allied to home work, it is already well known that no field work can produce permanently satisfactory results unless it is based on sound and well tested science. It is the function of teachers of household arts so to use theory in connection with practice that they can convince the world at large that this connection is a necessity. Surely there is no group of teachers with a greater opportunity than is offered to the teachers of Home Economics to organize scientific, ethical and economic principles in such a way that they will bear directly upon actual work, first in the classroom and then in the home.

The editors of the *Journal* have been very desirous of presenting articles on domestic art, but so far there has been difficulty in obtaining suitable material. As noted above, a study of methods of teaching in this branch will appear in the October number and we hope that it will be the beginning of helpful discussion of the subject in our pages. But what is, perhaps, more needed is to increase our body of knowledge on all domestic art subjects.

The scientific journals contain a large amount of material on domestic art topics such as the studies of the composition of silk by Abderhalden and his associates, which are being published in *Zeitschrift für Physiologische Chemie*. Many of the chemical and technical journals contain articles on dyeing, and material is published from time to time comparable with the note which is to appear in the *Journal* on the use of diastase for removing starch from clothing sent to the laundry, a

method which presumably entails less wear and tear on starched goods than the usual methods. It would be well worth while for some of the teachers of domestic art to endeavor to collect from the journals of recent years and other similar sources of information the data applicable to domestic art topics, so that the fund of knowledge available to teachers may be comparable with that which pertains to the composition of foods and other topics related to domestic science. Students might also be encouraged to take domestic art subjects for thesis work, and it should be possible to select topics which are capable of scientific treatment. Miss Crook's work on testing textiles affords an illustration of what can be done. For instance, it is said that a great deal of difficulty is experienced in dyeing raffia evenly, one surface taking the color much better than the other. Why could not some student study the problem and determine whether this is due to the different structure of the cells on the two surfaces of the raffia? The two surfaces of grass blades differ materially in this respect and if the surfaces of raffia cells should be found to differ, it is natural that their power of absorbing and holding dyes should vary correspondingly.

The protective power of clothing as affected by its material and color is another very interesting subject and an excellent piece of work could be done by a student or teacher who would go through a set of that mine of information, the *Archiv für Hygiene*, in order to collect and digest the articles on that subject.

Those interested in the Milk and Baby Hygiene movement and those who believe in dairy farming as an occupation for women as well as those who are leading in one of the greatest
A Summer sanitary movements of the day will be glad to learn
Dairy School. of a summer dairy school to be held from June 7-July 19. For particulars, address Mrs. C. B. Ware, Norfolk, Mass. The Warelands Dairy also offers for the week of July 25 to August 1 a conference on agriculture for women.

Back numbers of JOURNAL OF HOME ECONOMICS wanted, February, April and June Numbers of 1909 and February, 1910.

The unusual demand from new subscribers for the
Back num- complete file of our JOURNAL has depleted our stock
bers wanted. and we need a few hundred copies of each of the numbers mentioned above. Any member of the Association sending us copies will be credited for the full face value of same on their subscription account for the coming year, or paid in cash.

Be sure to place your *name and address* on the outside wrapper, so that the numbers can be identified and credit given to the proper person.

Mail to the Williams & Wilkins Co., 2427-29 York Road, Baltimore, Maryland.

The Editors of the JOURNAL would call the especial attention of members who have not paid dues for 1910 to bills that will be found enclosed in their copy of this issue of the JOURNAL.

To those who have not paid dues.

The first bill for the current year was sent out in March and the number of those responding to it has not been as large as we could wish. We believe that in most cases the omission to pay dues comes from inattention or forgetfulness, and that this appeal will meet with a ready response. Even in cases where the JOURNAL has failed to meet the needs of the subscribers, we feel that, having accepted three numbers, they can hardly in good faith refuse to meet the implied obligation to pay for it.

It has been suggested that there may be some misunderstanding as to the limits of the year. The JOURNAL issues five numbers, February, April, June, October and December, and all subscriptions are for the calendar year. A member writes "I paid \$2.00 last August, and yet you sent me a bill." This \$2.00 was for the year 1909, and we should like to think that our correspondent feels that she has had her money's worth in the five numbers of that year and wishes to continue to receive the same help. The editors are most desirous that the members of the Association shall look upon the JOURNAL as something that they own and conduct in the interest of a cause which we all hold to be of vital importance in our modern education and daily life, and that the majority of them do so regard it is evidenced in the cordial and helpful correspondence that comes to the office. But perhaps it is not as easy to grasp the fact that in starting such a journal we have assumed financial responsibilities that must be met from month to month. Our only income is from our dues of \$2.00 a year, which must also pay the expenses of the annual meeting and we hope that all interested readers will help to enlarge our list of members. Send to the editors lists of names to which we can mail a folder describing the aims of the association, see that the teachers of Home Economics in your community know of the publication and the help that it offers, ask that it be placed in your public and other libraries and tell your

friends that it is there that they may call for it. Bring it to the attention of women's clubs, intelligent housekeepers, social workers and all those interested in a higher standard of daily life.

The editors have far-reaching plans for enlarging the usefulness of the JOURNAL and they should not be hampered by a small or uncertain income.

We wish to call special attention of members to the necessity of sending prompt notice of change of address. **Addresses of Members.** It should be remembered that second-class mail matter is not forwarded by the post-offices unless postage is furnished.

For lack of space we were unable to print in the June number a valuable article by Flora Hartley Greene, her thesis presented to the College of Agriculture of the University of Missouri in partial fulfillment of the requirements for the degree of Master of Science, subject "On the Amount of Edible Meat in the Various Cuts from Animals of Known Life Histories." This thesis will appear in our October issue, but as announcements of original work cannot with fairness to the investigator be delayed, we wish to call attention in advance to this article and to quote part of the results based on a large number of experiments in which the waste of bone and fat and of water through evaporation by cooking is carefully considered.

Although data have been previously reported as to some of these points, the investigation is believed to be of special interest because of the unusual opportunities afforded the author to learn the conditions under which the beef was produced, records being available as to the previous history of each animal and the food which it consumed. The data are summarized below:

Percentage of Edible Meat in Various Cuts of Beef.

	PER CENT OF EDIBLE MEAT.	COST OF EDIBLE MEAT PER POUND.	BUTCHER'S PRICE PER POUND.
Beef Loaf.....	72.9	20.6 cents	15 cents
Braised Round.....	61.47	24.4 "	15 "
Broiled Rib Ends.....	36.5	27.5 "	10 "
Rib Roast.....	41.6	37.5 "	15 "
Porter House Roast.....	41.2	61.1 "	25 "
Porter House Steak.....	42.2	63.3 "	25 "

ANNOUNCEMENTS.

GRADUATE SCHOOL OF HOME ECONOMICS

Arrangements are in progress to hold the third session of the Graduate School at the Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa, July 6-20. This will afford opportunity to members to avail themselves of many of the advantages of the fourth session of the Graduate School of Agriculture, which will be held at the college, July 4-29.

Among the courses tentatively announced for the Graduate School of Agriculture during the sessions of the Graduate School of Home Economics may be mentioned as of special interest those on sociology, by President K. L. Butterfield of the Massachusetts Agricultural College; on economics by Dr. H. C. Taylor of the University of Wisconsin and Dr. B. H. Hibbard of the Iowa State College; on farm buildings by F. H. King; on factors influencing the keeping qualities of butter and milk, by L. A. Rogers and S. H. Ayers of the Dairy Division of the U. S. Department of Agriculture; on landscape architecture, by Prof. J. S. Pray of Harvard University; and on plant physiology by Dr. E. von Tschermak, professor of Plant Breeding in the Royal Agricultural College of Austria. There is also planned a round-table conference on agricultural journalism for July 9; excursions to typical Iowa farms, July 16; a discussion on the evening of July 13 of university extension in general, led by Prof. L. E. Reber of the University of Wisconsin and President Edwin E. Sparks of the Pennsylvania State College; and an address on the evening of July 15 on the status of agricultural extension at home and abroad, by Prof. John Hamilton, farmers' institute specialist of the U. S. Department of Agriculture.

The special program of the Graduate School of Home Economics has not yet been fully decided upon. In connection with it, one course has been suggested by Miss Caroline L. Hunt to be called *The Scientific Basis of Progressive Legislation Affecting the Welfare of the Home*, and to include not more than one lecture a day during the session.

This course is suggested by the fact that in the various legislatures and city council laws and ordinances are being introduced with the purpose of improving the conditions which affect home life. In support of such legislation arguments are being made which are based on scientific data, and it frequently becomes very desirable for those interested to know how far these data can be relied upon. For example, ordinances providing for the proper care of streets are being urged on the ground that diseases are transmitted by dust. Changes in the methods of disposing of household waste and stable refuse are urged upon the belief that flies carry disease. Building regulations are demanded on the ground that sunlight and fresh air are necessary to physical vigor. The demand for laws limiting hours of labor in factories is often based on physiological and chemical studies of fatigue, and on the belief that if labor continues too long reactions become slow and there is special danger of injury by machinery. This may be considered a home problem if for no other reason than that it affects the working power of the bread winners of families. In the case of women it is urged that overwork will affect disastrously the physical stamina of the next generation.

Those who are interested in such legislation and regulations must understand the scientific basis upon which they rest if they are to advocate them intelligently. They must know what work has been done which proves the necessity for legislation, what work remains to be done if the plea is to be based on other than general and sentimental arguments, and what reported work is unreliable. It is very desirable that students of Home Economics should be able to possess such knowledge.

Only a beginning is contemplated this year. Miss Hunt is to give one or two general introductory lectures, and Dr. C. F. Langworthy is to report on the literature of the physiology and chemistry of fatigue, and to discuss the possibilities of the respiration calorimeter as a means of furnishing scientific data in this connection. Other addresses are being arranged for.

It is intended to restrict the course very closely, excluding unrelated material and confining scientific work to that bearing directly on legislation which is at present being generally advocated, and to legislation which will be recognized by all as affecting home life.

Other courses are also contemplated. Those interested should communicate with Miss Edna D. Day, University of Missouri, Columbia, Mo., who is chairman of the committee of arrangements.

AMERICAN HOME ECONOMICS ASSOCIATION.

Sectional Meeting in conjunction with the National Education Association, for the Discussion of Methods of Teaching in Elementary and Secondary Schools. Headquarters: Margaret Cheney Memorial Room, Massachusetts Institute of Technology, 30 Trinity Place, Boston, Mass. Mrs. E. H. Richards, Chairman.

PRELIMINARY PROGRAM.

First Meeting: Tuesday, July 5, 2 p.m. Miss Helen Kinne, Chairman.

Topic for discussion: Presentation of Subject Matter in Household Science and Arts to Elementary Pupils.

Second Meeting: Wednesday, July 6, 2.30 p.m.

Topic for discussion: Methods of Teaching Household Science in Secondary Schools.

The speakers are to be announced later. Many prominent persons are expected to take part. Information regarding accommodations may be obtained in advance by writing to Mrs. E. H. Richards, Massachusetts Institute of Technology, Boston, Mass.

CONFERENCE ON INSTITUTIONAL MANAGEMENT.

A sectional conference of the American Home Economics Association will be held at the Lake Placid Club, Lake Placid, New York, June 27 to July 2, 1910. Members of the association who are engaged in household and institutional administration, or in related teaching work, are cordially invited by the trustees of the Lake Placid Club to attend the conference. Persons engaged in the management of college and school dormitories, dining room and school lunch rooms, and in scientific and educational work directly related to such undertakings, are especially invited.

The following provisional program is announced, and a detailed program will be mailed to members of the association early in June.

1. The Expanding Field of Household Administration, its divisions of professional service and the training in preparation for each. Nomenclature. Function of each position, for example; Dietitian, Superintending housekeeper or matron, Purveyor.—Miss Adelaide Nutting of Teachers College and others.
2. House Planning for Institutional Households.

3. The Financial Management of Institutional Households: Systems of Accounts, including budgets, schedules and records.—Miss Katharine Sharp, Lake Placid Club.

4. The Organization of Labor in Institutional Households as regards Time and other Factors.—Miss Alice Patterson, Mt. Holyoke College, South Hadley, Mass.

5. Ideals in the Organization of the College Dormitory.—Miss Dora Eaton, University of Ohio.

6. Qualifications and Training of the Director of the College Dormitory.—Miss Lydia Southard, Whittier Hall, Teachers College.

7. The College Dormitory as a Teaching Field.—Miss Mary Urie Watson, Macdonald Institute, Guelph, Ontario.

8. The Buyer or Purveyor for the Institutional Household.—Mrs. Miriam Loomis, Laselle Seminary, Auburndale, Mass.

9. The Institutional Kitchen and Dining Room: Its arrangement, equipment and service.—Mrs. Melvil Dewey, Lake Placid Club. Miss Florence Corbett, Teachers College.

10. Dietetics and Dining Room Management.—Miss Emma Smedley, William Penn High School, Philadelphia, Pa. Dr. C. F. Langworthy, U. S. Dept. of Agriculture, Washington, D. C.

11. Trained Workers in Institutional Kitchens.—Miss Colburn, Chicago.

12. Training for Supervision of Institutional Laundries.—Miss Clara D. Noyes, St. Luke's Hospital, New Bedford, Mass.

The trustees of the Lake Placid Club through the President and Vice-President, Mr. and Mrs. Melvil Dewey, extend an invitation to all who attend the conference to accept the hospitality of the Club. Rooms will be furnished without expense to the delegates, and the charge for table board is \$2.50 a day.

It is hoped that special rate railroad tickets can be secured. If not, mileage can be used and unused tickets will be redeemed by the Club. Delegates are invited to arrive at the Club on Monday night, June 27, so that the conference can begin promptly on Tuesday morning. Those who can do so are invited to remain over Sunday, July 3. As mentioned elsewhere the Boston conference on Home Economics education in connection with the National Education Association takes place on July 5 and 6. Delegates can thus go immediately from Lake Placid to Boston and attend both conventions.

Persons desiring to attend the conference should address at once, Home Economics, Lake Placid Club, Essex County, New York.

NEWS FROM INSTITUTIONS.

Mrs. Mary D. Chambers, director of Home Economics, writes as follows: "Our senior students in Home Economics are now in the midst of the great work of the term—the practice teaching. Part of this is done in the cooking centers of the Rockford (Ills.) public schools, part in the college, with classes of college students. While each girl in turn conducts a laboratory period the rest of the class sit around with notebooks and pencils, and armed with their very keenest critical faculties. The result is evident during the discussions that follow, which are the liveliest we have; and where, up to the present, every "practice-teacher" has shown herself worthy of a medal for "coolness under fire."

Rockford College.

Our beginning class think they are making bavaeroises, charlottes, and diplomatic puddings. But the day of reckoning is at hand, when they are to see that all these dainties were merely vehicles for the truths concerning the reaction of commercial gelatine to water, heat and acids.

"All of us, seniors, juniors and teachers, are formulating arguments for the truth that is in us, viz: whysome phase of this subject should form a part of the curriculum of all schools—on the basis of its economic, sociological and cultural value."

At the second annual farmer's meeting held in February, Home Economics courses were offered by the college for the first time in its history. Among the speakers were Mrs. E. H. Richards, Miss Anna Barrows, Miss Isabel Bevier, and Miss Helen Louise Johnson. The courses were well attended and with the increasing interest now being widely manifested in the state in all forms of extension work should be productive of much benefit.

Massachusetts Agricultural College.

The summer school to be held from July 11 to August 12 includes three courses in domestic science, under the direction of Miss Harriet Rinaker of the University of Illinois.

A home maker's conference was held in connection with Farmers' Week, February 7-12. Some of the subjects treated were house furnishing, home nursing, the amenities in home life, a demonstration of approved cooking appliances, household conveniences, household expenditures, dwelling house score cards, Home Economics at Cornell University, past, present and future, building materials, elements of house planning, physical attitudes in housework, emergencies and the family income.

New York State College of Agri- culture, Cornell University.

A bill has passed the state legislature appropriating \$154,000 for the construction of a Home Economics building.

Beginning with September, 1910, the present two years' normal course in domestic science and art will be extended to three years. This change is being made to meet the growing demand for more broadly trained teachers of Home Economics.

Mechanics Institute Rochester, N. Y. For the first year and a half of the course the curriculum will be the same for all students, opportunity to specialize being offered during the remainder of the three years, with allowance made for an extra amount of observing and practice teaching during the senior year.

To meet the requirements of the new curriculum more laboratory space is needed and rooms in the Eastman Building will be equipped during the summer accordingly—an additional chemical laboratory for special work in foods and a larger biological laboratory and lecture room being the most important of the improvements.

Besides the teachers' course, Mechanics Institute offers a one year course in home making to young women who wish to supplement school or college training with practical study in Home Economics; also a one year course in lunch room management where women of maturer years may fit themselves for the new and lucrative field of directing cafeterias, factory or school lunch rooms, etc.

In consequence of the death of Mrs. Hattersley, director of the school of domestic arts, on January 15, and the resignation of Miss Edith Greer, director of the school of domestic science, which takes effect July 1, it has been deemed expedient to carry out the frequently discussed plan of consolidating these schools under one administration to be known as the School of Household Science and Arts. Miss Isabel Ely Lord, librarian of the Institute and a member of the general faculty for about six years, has accepted the directorship of the new school. The three types of work that have hitherto been carried on, viz: normal training, technical training for trades use, and technical training for home use, are to be continued and several short new courses for home-making and servants will be added. The schools have a combined enrollment at present of over 1500 students.

The state federation of womans' club is raising a scholarship fund of \$15,000' the income from which is to be given to students in Home Economics. It is expected that at least one student will be receiving the benefit of this fund by September, 1910.

Pennsylvania State College. Miss Sara C. Lovejoy, dean of the department of Home Economics, has been continuing the extension work begun by the department two years ago, and has traveled extensively throughout the state presenting the subject. The department has added to its equipment this year a new laboratory for work in chemistry of foods and of nutrition under the direction of Miss Elizabeth B. Bower.

Miss Ellen A. Huntington, director of the department of domestic science and art has kindly sent a program of the housekeeper's conference held at the college Jan. 24-Feb. 5. This conference is believed to be unique in its combination of practical instruction in the laboratory in connection with the public lectures. The program of the conference states the aim as follows:

Agricultural College of Utah.

"The housekeeper's conference is designed to aid the women of the state in their household needs. Practical instruction in cooking, sewing and sanitation will be given in the new and completely equipped laboratory of the woman's building, and ample opportunity will be offered for discussion of individual problems.

"A public lecture on topics of general interest will be given each afternoon by the president and members of the agricultural college faculty, and well-known lecturers. In connection with the conference an exhibition on "flies" will be shown. The various departments of the college have coöperated in arranging this exhibit, which is of universal interest. The dairying, poultry and horticultural meetings for farmers will be held at the same date and classes for women will be arranged.

"The general fee for the course is one dollar; and a slight additional fee to cover the cost of materials used is charged students who take the cooking course."

In the two weeks of the conference there were held eleven demonstration cooking lessons of the most simple and practical character; seven lessons in sewing, covering the purchase, cutting, fitting and finishing of a dress; three lessons in house sanitation and eleven public lectures on practical topics, chief among which seems to figure agricultural life for women.

The woman's building of the college was also the scene of an afternoon, evening and morning meeting of the Western Branch of the American Home Economics Association, on February 4 and 5. The subjects for discussion were a course of study for the high schools of the state, domestic science for the schools of the state and housekeepers as consumers.

Miss Bertha M. Terrill, professor of Home Economics, has been obliged to give up part of her work on account of illness. Her course in the summer session will be carried on by Miss Adelaide Abell of the Technical High School, Providence, R. I.

**University of
Vermont.**

Miss Nellie Crooks, director of domestic arts, has been appointed director of Home Economics for the ensuing year. Miss Hanson, who has been the director of domestic science, leaves to pursue further study. Miss Crooks is also giving a course of lectures on textiles in the University of Wisconsin.

**Milwaukee-Dow-
ner College.**

Another most interesting program for a women's course in Home Economics was carried out at the University of Wisconsin College of Agriculture, February 8 to 12.

Among the subjects treated in lectures and demonstrations were the following: Value of ventilation in the prevention of disease, and in farm dwellings and rural schools; the house plan; house sanitation; physical development of the child; home decoration and furnishing; house drainage and sewage disposal for country homes; bacterial contamination of milk; insect pests in the house; adulteration of textiles and foods; and the preparation of food in many of its aspects. In addition to the regular instruction staff of the university, lectures and demonstrations were given by Miss Anna Barrows of Teachers College, Joseph E. Wing of *Breeders' Gazette*, President L. D. Harvey of Stout Institute, Menomonie, Wisconsin, and Miss Nellie Crooks of Milwaukee—Downer College.

**University of
Wisconsin.**

The department of Household Economics of Northfield Seminary was organized twenty-two years ago by Miss Emily Huntington. It now has splendidly equipped quarters in the new Home Science Hall, and although there are four teachers many more students ask for the work each term than can be admitted. One term of cooking and one of sewing are required for graduation from any seminary course.

Elective work is offered in dressmaking, millinery, basketry, embroidery, advanced cooking, and housekeeping.

The last mentioned is a professional course, lasting one and one-half years, and the instructors are striving to combine in it a good scientific foundation and much practical application. The house "from attic to cellar" is studied in regard to construction, furnishing and care. The study of food and dietetics is continued from the other courses, with the calculation and preparation of balanced dietaries, first for those in comfortable circumstances, then for limited means, and finally for the lowest possible cost.

The school nurse gives lectures on home nursing, the school buyer on buying, and special courses in household chemistry have been arranged. Laundry work is also taught.

As the work of caring for the nine dormitories and the preparation of food for the four hundred and fifty residents of the school is done as "domestic work" by the students, an unusual opportunity is offered for practical training and experience.

A course of six lectures and demonstrations was given by Miss Anna Barrows during the week of February 14. The course was arranged especially for the students and teachers of the Institute, but **Stout Institute** **Menomonee, Wis.** was also open to the public on payment of a small fee.

The opening of this new school is awaited with great interest. Mr. Charles R. Allen, the principal, writes that he cannot give as yet any coherent material about the girl's work but sends an announcement of his evening classes. The school had on file about seven hundred and fifty applications for these courses which opened in March. **New Bedford** **Mass., Industrial** **School.** The girls' courses are expected to be opened in September.

The evening courses included in general practical and systematic instruction in the principles of dressmaking and millinery, and are intended to help a student to learn how to make her own hats or clothing economically and well, or to give some preliminary training to a girl wishing to secure work as a dressmaker's or milliner's apprentice. These courses are open free of charge to any girl or woman over 14 years old, and are to be maintained for a period of at least ten weeks if the attendance is sufficient. Those who complete the course in a satisfactory manner will be entitled to a certificate.

NEWS FROM THE FIELD.

Miss Etta P. Flagg, chairman of the domestic science section of the Los Angeles City and County Teachers' Institute reports the following list of California towns as having domestic science courses: Berkeley, Eureka, Fresno, Compton, Auburn, Oakland, Ontario, Oxnard, Pasadena, Pomona, Redlands, Riverside, Santa Barbara, San Bernardino, San Diego, Santa Monica, Los Angeles, Huntington Park, Sacramento, San Louis Obispo, Eldorado, Ventura, Watsonville, and Long Beach.

Home Economics Work in California.

Miss Flagg also sends a report of the meeting of this section held at the Polytechnic High School, Los Angeles on Monday and Wednesday afternoons, December 20 and 22, 1909. On Monday afternoon the elementary school was discussed. Miss Mabel Morgan and Miss Mae McKinley discussed how domestic science work could be made more educational. Both contended that this could be accomplished by a more thorough study of the presentation of the lessons and by realizing more fully what a wealth of material was included in these reports. The value of more vocational training was considered by Mrs. Minnie Brennan, a domestic science teacher, Mr. Frank Bowelle, a city school principal, and Mr. Robert Lane, director of the newly started trade school. All were in favor of more work. The question, Should the Work in the Elementary Grades be Vocational was discussed by Miss Mary Murphy and Miss Belle Wallace, both city school principals, the former advocating it and the latter opposing it.

On Wednesday afternoon Miss Nelle Miller, from the Domestic Science Normal School in Santa Barbara, gave a forceful talk on Vocational Work in the Secondary Schools, in which she maintained that the cost of material, the time necessary, and the difficulty of disposing of the finished production made the question of more vocational work in the secondary schools most difficult of solution. She likewise thought that the trade school spirit should be most carefully eliminated from the vocational school. This paper was followed by a discussion by Miss Delp and Miss Grey, Los Angeles city domestic teachers, both of whom believed in more vocational work.

On December 23, the Pacific Coast Home Economics Association held its regular meeting in connection with the Southern California Teachers Association. Dr. T. W. McArthur of Los Angeles gave a most practical and helpful talk upon *How May the Teacher Safeguard the Health of her Pupils*. Mrs. Lulu Hilliker, supervisor of domestic science in Redlands read a comprehensive paper on *The Domestic Science Normal Schools of the United States and Canada*. Miss Huntington, of the Agricultural College of Utah, spoke of the domestic science work in that state. All of these meetings were well attended and much interest was shown.

Miss Clark of Oakland, Cal., writes: "The Home Economics teachers of California have two thriving organizations; their successful work shows in the rapidity in which the work is being extended in the state each year, and in the larger movement toward more industrial arts in the schools."

Women's Institutes are coming to be an established branch of the Department of Farmers' Institutes in many states. They vary greatly, however, in their methods and in the character of the work given. Too often in meetings for women, cooking is taught to the exclusion of all other branches of Home Economics, with the result that in the minds of the average woman, Home Economics has come to be synonymous with cooking and recipes. As the average woman on the farm is a pretty good cook, she often resents the idea of some one coming to teach her to cook, and the criticism is often heard, "I can make just as good bread as she did," or "Her cake is no better than mine." The principles of cooking are important, but not more so than the principles of nutrition or the questions of sanitation. The farmer has accepted the teachings of science in his work. He understands the importance of a well balanced ration for his dairy cows and is learning the necessity of sanitary stables. These principles applied to home will be of equal interest to the farmer's wife, and in many cases will open up new fields of thought for her.

With these ideas as a basis, special women's institutes are being held in Maryland this year. One day, with morning and afternoon sessions, is devoted at each place. There have been no lessons in cooking, but instead the subjects of the lectures have been Importance of Training for Home Making, Some of the Sciences that Help in the Daily Work of the Home, Household Bacteriology or Why and How We Clean, Nutrition, and lastly a talk in Organization. The aim has been principally to impress the importance and the scope of Home Economics. Where there was already in the community an organization, such as a Grange or Club, it was urged to strengthen itself by systematic study, the women applying themselves to the study of Home Economics. Where there was no organization, steps were taken to form one. Miss Emma S. Jacobs and Mrs. H. J. Patterson have been conducting this series of meetings and have found the women interested and responsive, and, to a certain extent, determined to have it taught in the public schools.—ELIZABETH H. PATTERSON.

The annual meeting of the Home Economics Association of Greater New York was held at the Hotel Brevoort in New York, January 15. A luncheon, at which were present seventy-nine members and their guests, preceded the business meetings. Miss Florence Willard presented her report as delegate to the Boston meeting of the American Home Economics Association. At the election of officers the following were chosen for 1910:

President, Helen Kinne, Teachers College; Vice-Presidents, Mary E. Williams, Supervisor Domestic Science, New York Public Schools and Mary Simkhowitch of Greenwich House; Secretary-Treasurer, Mary Tough, 19 Clifton Place, Brooklyn; and member of the executive committee, Ruth Wheeler, of Brooklyn.

Miss Kinne introduced the speaker of the afternoon, Miss Edith Greer, whose subject was Home Economics in Europe. Miss Greer spoke of life as she saw it in Italy, Switzerland and Holland, these being the countries where most of her time was spent last year. She found much of reality and charm among these people and much, too, for us to make use of educationally. In Italy, the handiwork which is marvelous in technique, has in it the superb art of the country's earlier days; the art, as art, she found distinctly inferior to the handiwork, whereas in this country

there is general opinion that the reverse of this is true. After referring briefly to the work in Switzerland and Holland, the speaker concluded by expressing the hope that we might come to the performance of our work with ability to secure the beauty and finish of Italy, the definite execution of Switzerland and the immaculate cleanness of Holland.

Other speakers of the afternoon were Miss Isabel Bevier of the University of Illinois, and Miss Gwendolyn Stewart, who spoke of the work done in Kings College for Women in London, England, under the direction of Miss Alice Ravenhill, whose recent visit to this country made her well known to many members of the Association.

At the annual meeting held at Teachers College, Columbia University, New York City, during the Christmas holidays, the New York State Industrial Art Association gave an afternoon to the discussion of vocational work for girls. Addresses were given on The training of Girls for the Industries, by Mrs. Mary Schenck Woolman, Professor of Domestic Art, Teachers College, and Director of the Manhattan Trade School for Girls, and on Household Arts and Science as Vocational Training for Girls, by Miss Helen Kinne, Professor of Domestic Science, Teachers College. On another afternoon Miss Martha Van Rensselaer of Cornell University, spoke on Vocational Work for Country Girls.

There occurred in Cleveland, February 11, an event most promising for the future of Home Economics in Ohio. This was a joint meeting of the domestic science and domestic art section of North Eastern Ohio Teachers' Association and of the domestic science and domestic art section of the Ohio Arts and Manual Training Association. Previous to the meeting, letters were sent to all teachers of these subjects in the State announcing the purpose of the meeting and the program.

A round-table session at the Central High School at ten o'clock a.m. opened the meeting. Addresses were given on:

Domestic Art: Its Content and Possibilities, by Miss Anna K. Flint, of Ohio State University; and Domestic Science, by Dr. Benjamin R. Andrews, of Teachers' College, Columbia University; and a discussion of the domestic science courses in Columbus, Toledo, Canton, and Cleveland, by Miss Faith R. Lanman, Miss Mathilda Campbell, Miss Edith Wise, and Mrs. Ada B. Williams, respectively.

A business session followed at which a general desire was expressed for the formation of a state organization of home economists. The Misses Campbell, Wardall, Colwell, and McKinley and Mrs. Williams were appointed a committee to present plans for the formation of such an organization and to outline roughly a constitution.

Luncheon was served at the Technical High School, where in the lunch room, 74 covers, each having a place card designed and made in the applied arts department of the school, were prepared for the guests. A class of high school girls who were having a course in planning, cooking and serving meals, served the luncheon in three courses. After-luncheon talks followed by Mr. Barker, Principal of the Technical High School, acting as toast master, Mr. Elson, Superintendent of Public Instruction, in a speech of welcome, and Dr. Andrews, who discussed the Boston meeting of the American Home Economics Association. The visitors then inspected

the building, especially the household arts departments, where there were exhibits of domestic art work from the public schools of Dayton, Akron and Cleveland.

At 3 o'clock p.m. the business session was resumed, and following a favorable report of the committee, an Ohio Chapter of the American Home Economics Association was organized. The following officers were elected: President, Miss Rachel H. Colwell, Lake Erie College; vice-president, Miss Mathilda Campbell, Toledo; secretary and treasurer, Mrs. Ada B. Williams, Cleveland; and Miss Mabel McKinley, Dayton, delegate to the National Association.

At 4 o'clock p.m. the Cleveland Domestic Science and Domestic Art Club received their visiting friends in the Benjamin Parlor of the Young Women's Christian Association.

Miss Frances E. Sale, Director of the Department of Household Arts of the Harrisonburg (Va.) Normal and Industrial School for Women, reports as follows:

Home Economics has been introduced, so far, into only a few of the Virginia schools. The people are beginning to realize its importance and are putting it into more schools each year, so that we hope in the near future to be able to report each school as teaching at least some phase of the subject. The interest of the people is being aroused and they are putting forth an effort to establish, at least, cooking and sewing in their schools.

All three of Virginia's Normal Schools have the department of household arts. Farmville, which is the oldest, has had it three years, but succeeded only this year in getting the cooking laboratory equipped. Fredericksburg hopes to open its Normal School in the near future and this department will probably play an important role there. Domestic science has been taught several years in the schools at Staunton, Richmond, Lynchburg, Norfolk, and perhaps in a few other towns. There are always summer schools, too, in which this subject receives its share of attention.

At Harrisonburg Normal and Industrial School for Women, which began its first session in September, 1909, the department of household arts is offering at present a course which covers two years. The general aim is to teach the art of right living, through the elevation of the ideals of the home and through the application of scientific principles to the management and work of the household.

During the first quarter, or twelve weeks an elementary course was given in sewing, covering four periods (forty-five minutes each) per week. This was so popular that three sections had to be formed, and more sewing machines provided. A small exhibit of the work was given at the close of the quarter, which was very gratifying to the school authorities. According to the wish of a number of the students, the course has been continued through the second quarter. The sewing room is a very large, well-lighted room and is supplied with machines, electric iron, tables, desks, mirrors, lockers, etc.

A course in Home Economics was also given which included two periods a week. This course is being followed by one in home cleaning and laundry the second quarter, and home nursing the third quarter, thereby completing the year's work. In January, the work in cookery was begun. The rooms, two in number, are on the top floor of the Science Hall. They are light, well-ventilated rooms, and like nearly every room in the Hall, afford excellent views of the surrounding valley and mountains. One a large, oblong room is fitted up for the laboratory, and accommodates

twenty-two students. The desks are fitted with individual gas-stoves and with drawers which contain the necessary utensils. A large, deep cabinet with glass doors extends almost across one end of the room. The smaller room is fitted up as a dining room, but also contains the coal-stove as there was no other place for it. A large screen which is being made in the manual arts class, will be used to screen the stove from the remainder of the room. The floor is of hard-wood, and the home cleaning class is studying the problem of the best method of treating it.

The gas used in the laboratory is generated at the school. A study of how it is generated and also how the building is heated and ventilated make interesting topics for the girls.

As this is the first course the girls have had in household arts, none of the work this year is advanced. They will have methods, observation and practice of teaching the second year. It is very probable that a course in cooking and sewing will be given in the summer school.

At a meeting of the State Teachers' Association at Richmond in November, a paper on household arts was read in the rural schools division. The object of the paper was to tell the teachers what is meant by household arts, and how it can be introduced into the rural schools of the state with little expense. A short sketch of what is included in domestic science, domestic art, Home Economics and home nursing was given, followed by a statement as to the importance of the subject and its real value to home makers, especially to the rural people. The last of the paper was devoted to what particular problems can be introduced into the schools with little cost, with a short discussion of the necessary equipment.

During this meeting the few household arts teachers of the state, who were fortunate enough to attend the convention, met and began what we hope to see become a state organization of the household arts teachers. A chairman was appointed and a request sent to the manual arts department of the association to be allowed recognition in the association as a group in its department. This request was granted and we hope to have a program next November at the annual meeting.

Domestic Science is part of the regular school work in the public schools of Washington, D.C. Work was begun in October, 1886, by two students who were graduated from the normal school the previous June and had studied

**Domestic Science
Instruction in
Washington, D. C.**

all summer with Mrs. Anna L. Woodbury. One teacher was assigned to the high school and the other to the elementary schools in one section of the city. So many pupils desired to take the work that large classes had to be formed and every hour filled.

Two years later, a sufficient number of centers having been furnished, the work was made a regular part of the instruction given all girls in the seventh and eighth grades. Two years later the cooking, which was the only branch of domestic science then taught, was taken from the high school course of study, but in 1901, a manual training high school having been organized, a full high school course in domestic science was prepared and offered. In 1908 "special" schools were organized for those children who for various reasons it was deemed wise to separate from the regular classes. It was decided that a full line of industrial work with little academic work was best for the development of such children, so the equipment necessary to teach the various household occupations as well as many other industrial subjects was purchased.

Boys as well as girls are given work along these lines. Progress is being made, but it is slow.

As soon as sufficient appropriations can be secured it is desired to extend the work in the regular schools and to give in connection with the physiology and hygiene of the lower grades, such practical household hygiene as can be taught in a school room. There are in our schools a certain number of children who for various reasons will never advance beyond the sixth grade. These children should have some knowledge of housekeeping and for this purpose it is hoped some day to secure funds to rent and to furnish one or more small houses; then, having these children in small groups teach them how to keep house there. Work in the bed room, bathroom, sitting room, dining room, kitchen, laundry, cellar and yards, will furnish sufficient opportunity to teach sewing, cleaning, marketing, cooking, serving meals, keeping household accounts, running fires, gardening, etc. Such experience will help to form habits which will do much to improve the homes in certain parts of the city.

Some of this work is given simply with the idea of having the children learn to do things. Other work is to teach them the how and the why of keeping things clean. Still another line is for the purpose of teaching what and how to feed people. The high school work has for its purpose training for homemaking which requires ability to apply the principles of the art and the science already taught. Five centers are open at night to adults, and many mothers avail themselves of this opportunity to learn what food to provide for their families and how to prepare it. One teacher has, at night school, a class of graduate nurses to whom she is giving a course in dietetics; another has a class of social workers to whom she is giving work which will help them in their house to house instruction in the selection, the preparation and the serving of food.—EMMA S. JACOBS, *Director of Domestic Science*.

The Woman's Educational and Industrial Union, 264 Bolyston Street, Boston, is conducting a unique course in salesmanship. This is in charge of a trained teacher

of domestic art, and is given in coöperation with the large department stores in Boston. The class is composed of thirty girls from these stores who attend the school daily except Monday for three months from 8:30 to 11:30 a.m. Mondays and afternoons they serve at their own shops. The managers of the stores pay these girls a wage of about \$6 a week during this term of instruction, and find it to their advantage to do so, as girls who have had the course sell more goods and rise rapidly to good positions. The subjects are most practical. Simple work in textiles is given so that an understanding of materials is gained, how they are woven and the names, prices and widths of the common ones handled. The origin and growth of the fibers is also studied. Lessons in color and design are presented in a most fascinating way through the use of ribbons, chiffons and other materials. Business arithmetic and the filling out of sales slips, exchanges blanks, etc., forms another part of the work. Lectures are given once a week by a woman physician on personal hygiene, care of the body, feet, proper clothing, etc. Once a week during the three months' demonstration sales are conducted and the girls take notes on good and bad points of the sale. These are given with actual materials and in a comparative way so that there is every opportunity for the girls to see a poor and good approach to a customer, the proper courtesy, a pleasant manner of receiving goods to be exchanged and methods of meeting other conditions likely to arise in shop work.

This course has been very successful and others are beginning to develop in different cities. The coöperation of the shops seems to be the great essential feature. The union has taken this year a few pupils for normal work in this department of salesmanship.

According to a recent communication from Miss Alba Bates of the Academy of Idaho, "Idaho is taking the lead in introducing domestic science and arts into rural schools. Our state normals are planning to make practical education a strong feature of the normal training course, President George H. Black of the Lewiston Normal is offering a course for the coming year in rural arts which includes that part of domestic science, domestic art, and manual training particularly adapted to such needs of the rural community as can be reached through the rural schools. For this work a new building has just been completed and will be supplied with the best possible equipment to bring about results which will mean much in the future of the rural school system of Idaho.

"The State Academy meets the need of those students, from rural communities and small towns so numerous in a new state, who do not have high school privileges.

"Rural high schools and centralized rural schools are being established throughout the state and in a very short time the course in agriculture and domestic science will be a strong feature of the work in these schools."

The Dewey decimal classification, in general use among libraries, in its 1910 revised edition, gives the following outline for household administration:

- | | |
|--|---|
| Library Classification of Household Administration. | 647 Household organization and administration. Institutional management. |
| | .1 Household accounts, finance, cost.
See also Bookkeeping 657. |
| | .2 Manager, superintendent, housekeeper, steward, dietitian.
See also 640.8. |
| .3 | Regular employees or assistants.
Uniforms. Employment bureaus.
For ethical consideration, see 173.8.
As part of Political Economy, see 331. |
| .32 | Male help. |
| .33 | Female help. |
| .34 | Foreign help.
Orientals, negroes, etc. Races and nationalities. |
| .4 | Indoor help.
Cook, butler, waitress, parlor maid, lady's maid, chambermaid, nurse, laundress, furnaceman, etc.
For housekeeper, steward, etc., see 697.2. |
| .5 | Outdoor help.
Coachman, gardener, laborers. |
| .6 | Occasional employees.
Emergency help, household register. |
| .7 | Wages, hours, duties. |
| 48 | Sanitary precautions. Laundry. Cleaning (subdivisions follow). |

The Home Economics Association of Greater New York is printing a bibliography of periodicals to be issued quarterly. The February bibliography is just out and covers such topics as Dietetics and Nutrition, Fermentation and Enzymes, Food, Sanitation, Textiles, and Houses and House Furnishings. Under Miscellaneous are articles on The Fly, Uses of Cotton Seed, Indian Blankets, Baskets and Bowls, Peat as a Fuel, etc. There are one hundred and fifty-three articles listed. The bibliography is in the hands of the committee on current literature, of which the chairman is Miss Ruth Wheeler, 305 Montgomery Street, West Pittston, Pa.

Single copies of the bibliography are sold for ten cents, or for the year the four copies may be had at twenty-five cents, payable in advance. Orders may be placed with Dr. B. R. Andrews, 525 West 120th Street, New York City.

This organization is to meet at Brussels, under the patronage of the Belgian Government, October 4-8. Its business will be conducted in seven sections, viz., biological physics and energetics; physiology and physiological chemistry; hygiene of nutrition, bacteriology and parasitology; composition, analysis and adulteration of foods and dairy products; potable waters; legislation, food inspection and control; and work of a popular character regarding rational feeding and alimentary hygiene. For the last section, which is of particular interest to Home Economics workers the following questions have been submitted for discussion:

1. The working man's food: What is it? Its price in large centers. What is its nutritive value?
2. International organization of fisheries as a means of obtaining food at low prices.
3. Is the preservation of meat by refrigeration advantageous? What is the best means of preserving meat? What is the best organization of slaughter houses?
4. Desirability of studying the changes of diet that certain classes of working men undergo when leaving one condition in one country for another, socially and physically (moving from the country to the towns; emigration from one country to another, etc.).
5. The classification of professions as regards outlay of energy; should it be revised especially as regards the working man? Food of working men not only in regard to expenditure of physical strength, but also in regard to their intellectual work.
6. Food law administration; coöperative societies of consumers; the food bakeries, restaurants, their conduct, their social importance; services rendered to hygiene. In what manner should the public authorities exercise control over the above institutions and in what cases should they be encouraged?
7. The teaching of alimentary hygiene and rational feeding in schools, and especially in large cities; the teaching of alimentary hygiene and rational feeding in other places than schools.
8. Food aid for children and old people.

The membership fee is twenty francs (\$4), which may be paid to the American representative of the Congress, Dr. H. W. Wiley, Bureau of Chemistry, U. S. Department of Agriculture, Washington, D. C., from whom additional information may be obtained.

BOOKS AND LITERATURE.

Elementary Domestic Science: Food and Cookery. SARAH WINDLE LANDES. 1909. Pp. 149. Guthrie, Okla., Leader Printing Co. Price \$0.50.

This handbook, which constitutes Part 1 of a school text-book on elementary domestic science, has been prepared chiefly to fit the needs of the upper elementary grades. One of its special aims is to correlate the subject of domestic science with the remainder of the curriculum, notably geography, agriculture and nature study, and history. It is divided into three sections, viz: Food, Cookery, and Elementary Chemical and Physical Experiments with Food Materials, and the arrangement is such that schools without equipment may use merely the first section, and those possessing chemical apparatus but no kitchen may take up sections 1 and 3. A large number of menus and recipes, a series of simple experiments, and a list of publications useful for reference, are included.

Housekeeping for Two. ALICE L. JAMES. New York and London: G. P. Putnam's Sons, 1909. Pp. vii+426.

Furnishing the home, laundry work, marketing, cleaning, care of furniture, social life, and similar questions are discussed in this volume, which is designed for those who are beginning housekeeping.

In some of the sections recipes are included and the volume is provided with an index.

Newer Methods of House Disinfection. G. SOBERNHEIM. *Arch. Volkswohl-fahrt*, 2 (1909), no. 12, pp. 708-717, figs. 6; 3 (1909), no. 1, pp. 12-14.

A summary of data regarding methods of house disinfection. The introduction of formaldehyde, the author concludes, has marked a great advance in household disinfection.

Preserve Labels. MISSES CHENEY AND CARMICHAEL, Artcraft Shop, Auditorium Building, Minneapolis, Minn.

This is a booklet of 400 adhesive labels arranged in perforated sheets like stamps and bound in an artistic cover. There are perhaps twenty different labels ready for the canning season.

The Dust Nuisance and Ways of Lessening It. D. LAYRIZ. *Die Staubplage und ihre Bekämpfung.* Munich, 1908; rev. in *Arch. Volkswohl-fahrt*, 2 (1909), no. 6, p. 396.

A summary of data on the street dust problem.

Hygienic Significance of Sulphur in Gas. F. E. GALLAGHER. *Jour. Indust. and Engin. Chem.*, 1 (1909), No. 9, pp. 656, 657.

According to this paper the SO_2 contents of gas lighted rooms is wholly negligible as regards comfort or health. In a case where the air of the room changed 1.8 times per hour with doors and windows sealed, one man actively exercising had about the same effect as gas burning at the rate of five feet per hour.

The Influence of Muscular and Mental Work on Metabolism and the Efficiency of the Human Body as a Machine. FRANCIS G. BENEDICT and THORNE M. CARPENTER. U. S. Dept. Agriculture, Office of Experiment Stations, Bul. 208, 1909, pp. 100, figs. 3.

In this monograph the first 44 pages are devoted to a discussion and details of experiments on "muscular work and body efficiency." Experiments were made with a number of different individuals while riding a special form of bicycle ergometer inside the respiration calorimeter then at Wesleyan University. With a professional bicycle rider the mechanical efficiency of man was found to be about 21 per cent. The resting energy output of 92 calories per hour was raised during very severe work to over 600 calories per hour of which 112 calories were transformed into muscular work.

A study of "the influence of mental work on metabolism" was also made upon twenty-two men, who were taking the customary college mid-winter examination. The men spent three hours inside the respiration chamber, during which time the water vaporized, oxygen consumed and carbon dioxide and heat produced were carefully measured. Compared with control experiments on the same individuals, the authors found that mental effort has no positive influence on metabolic activity.—VICTOR C. MYERS, M.D.

House Decoration. DOROTHY TUKE PRIESTMAN. Philadelphia. Pennsylvania Publishing Co., 1909, pp. 208. Illustrated.

The treatment of walls, the selection of furniture and floor coverings, the kitchen, the bathroom, home carpentry, and other related topics are taken up in this volume which as a whole is a useful handbook for the general reader.

Dorothy Brooke's School Days. FRANCES C. SPARHARK. Pp. 368. Price \$1.50.

Illustrations by F. T. Merrill. New York: Thomas Crowell and Company.

Any lively girl will enjoy this story of stirring episodes in boarding school life. The heroine is the kind of leader whose energies it is necessary to enlist to make any new departure succeed in a school. The reading of a story of this type might be helpful to many teachers of domestic science. Often special teachers are too engrossed in their subject sufficiently to consider the point of view of the student.—ANNA BARROWS

Town Planning and Modern Architecture at the Hampstead Garden Suburb.

T. F. and R. UNWIN and M. H. B. SCOTT. London and Leipsic, 1909, pp. 98, pl. 1, figs. 121.

This volume contains detailed plans for the laying out of a city suburb in a convenient manner, in such a way as to insure light and air and preserve a park-like character.

Plans are given for a large number of houses and the volumes as a whole is a contribution to domestic architecture, house furnishing, and related questions.

Euthenics. Mrs. E. H. Richards.

Whitcomb and Barrows expect to publish in June Mrs. Richards' book on this subject. We quote a paragraph which will give a hint of its purpose:

Euthenics has been chosen to express man's power over his immediate environment. It is a gospel of hope, of courage. It disregards the foe in the distant valleys and sets us at work on our own door yards. . . . We have come to the word which we must bind as a phylactery on our foreheads and as an amulet on our arms—"Responsibility." It is a longer word and suits the times. Our forefathers called it duty. We have forgotten the sound and the meaning of that word. Let us not revive it, but take the more expressive term of inter-relations, inter-actions, as more indicative of the time. Responsible we must be, if there is to be government, community life, race progress.

Household Arts Review. Teachers College, Columbia University, New York City.

The April number of this magazine, published three times a year by the Household Arts Club of Teachers College, contains some sixty pages of articles, many of them of distinct value to the student of Home Economics. Among the most important are the following: Industrial Education and Economic Evolution; The Social Services of the District Nurse; The Campaign for Clean Milk in New York City; The Teaching of Household Arts in Rural Schools; Household Science Course; Organization and Management of Dressmaking Establishments by College Women; Housewifery as a Branch of Sanitation; A Visit to the Public School on Barren Island.—B. R. Andrews.

Canadian Government Annuities, Comfort and Happiness in Old Age. S. T.

BASTEDO, Superintendent, Ottawa, Ontario, pp. 30.

This pamphlet outlines a system of annuities administered by the Canadian Government which forms a sane and commendable attempt to provide universal insurance for old age. The Home Economics movement must undertake an educational propaganda for thrift and the financial independence of the individual family, and this Canadian booklet is a welcome addition to our scanty literature on the subject.

A BIBLIOGRAPHY OF SCHOOL LUNCHEES

Nutrition Processes During the Growth of the Child. M. Rubner. (*Arch. Hyg.* 66 (1908), Nos. 1-2, p. 81.)

Dietary Studies in Orphan Asylums. Emma Smedley, R. D. Milner, H. L. Knight and C. F. Langworthy. In "Dietary Studies in Public Institutions." (*U. S. Dept. Agr. Office Experiment Stat. Bull.* 223.)

Applied Domestic Science, Daily Meals for the School Year, and a Dietary Study for October. (Institute for Colored Youth (Teachers' Training School) Cheyney, Pa., 1909, pp. 48.)

The Feeding of Infants and Children in Health. G. A. Sutherland in "A System of Diet and Dietetics," London (1908), pp. 743-799.

Diet and the Diseases of Children. G. A. Sutherland in "A System of Diet and Dietetics," London (1908), pp. 803-850.

Der Stoffwechsel des Kindes von der Geburt bis zur Beendigung des Wachstums. Tübingen, 1896.

Die Verdauungsarbeit, ihre Grösse und ihr Einfluss auf den Stoffwechsel, insbes., den Stoffwechsel des Säuglings. 1900. Reprinted from *Jahrb. Kinderheilk.*, n. ser. 51 (1900), p. 26.

Zur Physiologie des Säuglingsalters. Berlin, 1902. Reprinted from *Jahrb. Kinderheilk.*, n. ser., 56 (1902), p. 543.

Die körperliche Entwicklung, die Ernährung und Pflege des Kindes. Stuttgart. 1902.

School and Other Lunches. (*Phil. Press*, Oct. 12, 1909.) A commentary on the dietary work at the Teachers' Training School, and data regarding the appropriation of \$3000 by the Philadelphia Board of Education to test in three schools the practicability of furnishing three-cent luncheons.

The School Lunch-Room. Maude Parsons. (*Illinois Farmers' Inst. Bul.* 14, pp. 140). Also data regarding the school lunch work in Rockford, Ill. school luncheons. (*Survey*, 23 (1909), No. 11, pp. 350, 351).

Penny Luncheons. Alice C. Boughton. (*Psych. Clin.* 3 (1910), No. 8, pp. 228-231, fig. 1.)

Home Science at Bozeman. (*Dakota Farmer*, 30 (1910), No. 1, pp. 49, 50, figs. 7.) Contains data on lunches prepared for sale as part of the Home Economics work.

The School Child's Breakfast, W. C. Hollopeter. (*Jour. Amer. Med. Assoc.*, 53 (1909), No. 21, pp. 1727-1730.)

Penny Lunches. H. H. Bonnell, (*Starr Centre Soc. [Rpt.]* 1909, pp. 18-20, fig. 1.)

The Feeding of School Children. R. Crowley. (*Pub., Health [London]*, 23 (1909) No. 3, p. 101.)

School Canteens in Paris. L. Butte. (*Rev. Soc. Sci. Hyg. Aliment.*, 5 (1908) No. 3, pp. 573-616.)

Free Noonday Meals for Needy Children. C. Driessens. (*Rev. Soc. Sci. Hyg. Aliment.*, 5 (1908), No. 3, pp. 672, 673.)

The Theory of Nutrition after Completion of Growth. M. Rubner. (*Arch. Hyg.*, 66 (1908), No. 1-2, p. 1.)

T H E Journal of Home Economics

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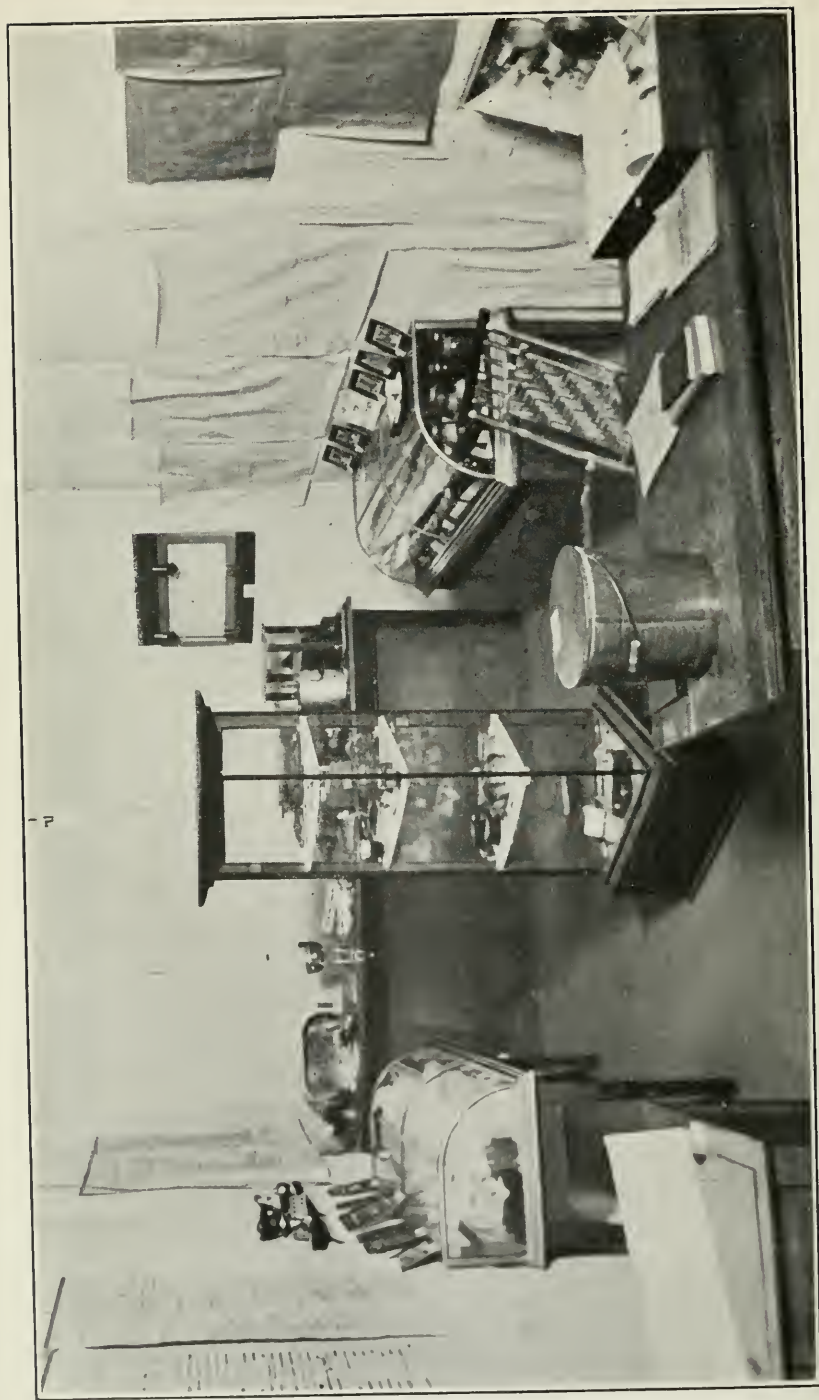
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EDUCATIONAL EXHIBIT OF THE DOMESTIC SCIENCE DIVISION OF THE UNIVERSITY OF MINNESOTA
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T H E

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THE BOSTON MEETING OF THE EDUCATION SECTION OF THE AMERICAN HOME ECONOMICS ASSOCIATION.

The Boston meeting of this section was called to order by Miss Helen Kinne, Chairman, at the Massachusetts Institute of Technology, at 2 p.m., Tuesday, July 5, 1910, with about 275 in attendance.

In her introductory remarks Miss Kinne spoke of the pleasure felt by all in having the president of the Association, Mrs. E. H. Richards, in attendance. She then announced as the subject of the meeting, the methods of teaching, stating that this was perhaps the first occasion on which members had limited themselves to this topic, and also the first opportunity for deliberate discussion of the "special method" in a given lesson. This subject had been decided upon because of the wide-spread demand for it. "What we want is to see how the great principles of teaching apply in our work, for teaching to be alive must grow"

The following address of welcome was then given by Mrs. Richards:

Twenty-five years of endeavor to secure a hearing and a place in the curriculum for household arts have just been completed. Special schools, special teachers have been working to accomplish this, with what success may be judged by the following prospectus, recently issued:

"Domestic Science: A Course of Lessons for Elementary Schools.

"This book, prepared to meet the needs of a course in domestic science, can be read and studied with profit in every household. The author has been careful

to make the lessons suitable for public, private and rural schools. Teachers with absolutely no knowledge of domestic science can teach the lessons by reading them over carefully and performing the work as directed.

"The lessons consist of two years' work, fifty-eight lessons in all. The author has herself taught all of the lessons contained in the book, and the work, as a whole, embodies results obtained through several years of successful experience.

"Domestic science in elementary schools should not require an expensive apparatus, and thus create a wrong impression among parents and operate to the disadvantage of the work. The money often spent on the salary of a special teacher of cooking will equip a school shop and a school kitchen, and with the full directions given in this book there is no more reason why there should be a special teacher in domestic science in the elementary school than in any other subject."

When a subject becomes so fixed that it may be embodied in print it is an accepted fact. Perhaps we should now sit back with folded hands—*but* is the work done? Could a living, growing science ever be so crystallized as to dispense with the living, growing teacher who is not afraid to say she was mistaken or that her science of yesterday has been superseded by the discovery of today. We had just learned to sweep when the vacuum cleaner made it unnecessary.

It is true that the leaders have been struggling to express they knew not what. The early movements were due to philanthropists who saw the effects of ignorance but not the causes. Most vigorous efforts have been made to teach the knowledge of past generations to the coming one but these have not produced results commensurate with the effort because of rapidly changing conditions. School and settlement methods have been largely of this nature. A dim feeling of their futility has kept the leading educators on the defensive until now.

Through various agencies here a little and there a little, the science applications are beginning to be recognized. At last it is seen that in a scientific age the daily life of the people may be improved by appropriation of invention and discovery—but the movement is even yet in a plastic state.

No set rules can be laid down, no hard and fast lines drawn. With the very new movement of first year science domestic economy must ally itself. It should contribute freely to the subject matter to be considered. For that more research is demanded, more exact illustrations of scientific application furnished, gathered from the actual doing *untrammelled by past tradition*. We cannot repeat that too often. The very essence of science is plasticity, quick adaptation to new theories, the progress in arts due to adoption of the most efficient processes even

if it means discarding the heirlooms of the past. The home and the household have been the fortress of tradition and stability—shall we risk levelling these walls? The fear that the mellow fruit of centuries will be sacrificed is what has held back the hand of the iconoclast. What would happen if home life became scientific? The results of the close shutting down of the hatches has been the breeding of festering discontent, the escape by illegitimate ways until even the most conservative have grudgingly yielded the point. If home life is to be saved, if the old time virtues are to be perpetuated, new forms must be found suitable for the time. Furthermore, all but the most bigoted recognize that the school of today must furnish the home of tomorrow with its weapons of defense. But the school of today must be in line with the scientific spirit of today, ever searching for the *better* way, ever trying the newest suggestion but discarding as quickly that which is not proving itself.

For the next few years therefore let us not crystallize our work or our plans into unalterable forms, but keep ever ready to take the next step, whether it be forward or to one side. No mountain peak is ascended straight up. Up hill and down hill the path leads before the top is reached. The right solution of the problem of keeping a happy, healthy home will come at last.

A paper was then presented by Miss Emma S. Jacobs of Washington, D. C., on A Practical Method of Teaching Household Arts in the Elementary Schools. Miss Jacobs took for an example the making of a fire, using a little glass model of a stove to make it quite clear. A paper on The Teaching of Household Furnishing and Decoration by Mrs. Mary E. Williams of New York City, was read by Miss Agnes Daley. The paper was accompanied by a most interesting exhibit. Miss Ednah A. Rich of California discussed How to make the Household Arts Effective in School and Community. These three papers may be found on subsequent pages of the JOURNAL.

Papers followed on The Improvement of the Public Health through Teaching of Hygiene in the Elementary School, by Miss Frances Stearn of Boston, one by Mrs. Ethel Fifield Brooks of New York City entitled A Lesson in House Construction, one by Mrs. Alice P. Norton and Miss Jessie P. Rich entitled A Lesson in Cookery in the Elementary School, and one on Our Penny Lunch Problem and How we Solve it, by Miss Emeline E. Torrey. Mr. E. C. Bishop, state superintendent of education of Nebraska then said a few words as to

how "they interested the boys in agriculture through corn raising and the girls in the use of corn products through corn cake," thereby making tremendous strides in interesting the children of the whole state.

A second meeting of the section was held on the following afternoon, in two sections, Mrs. Richards presiding over Section A, Textiles, and Miss Kinne over Section B, Foods and Sanitation. An over-flow meeting of Section B, at which the papers of that Section were repeated was also necessary, Miss Emma Jacobs presiding at this meeting. About 400 were in attendance at the various meetings.

In Section A the papers were as follows: Economy of Time in Technical Work, by Mrs. Blanche Hyde of Newton, Mass.; A Lesson in Dressmaking, by Miss Annie L. Bennett of the Practical Arts High School, Boston; The Teaching of Millinery, by Miss Clara S. Gay, of the same school; and the Teaching of Design to Trade Classes, by Miss Grace W. Ripley, of the Girls Trade School, Boston. These papers are printed elsewhere in this issue.

In Section B the following papers were presented: How to Apply Laboratory Methods to the Study of Practical Cooking, by Miss Carlotta C. Greer, Cleveland Technical School; How to Teach the Preparation of Meals, by Miss Florence Willard of New York City; How to Use the 100—Caloric Portion in Dietary Teaching, by Miss Mabel Wellman of Chicago; Subject Matter in a Course on Foods for College Entrance, by Miss Lillie C. Smith, of Brookline, Mass.; and Methods in Housewifery, by Miss S. Maria Elliott, of Simmons College (reprinted in this issue). Mr. Hollis Godfrey also said a few words on Motherhood and the City, as studied and treated by the Garland School.

A resolution of approval was passed by the meeting on efforts looking toward the articulation of high school and college work. After some discussion as to the point valuation for the household arts work the meeting adjourned about 4 p.m.

The following resolution was submitted for action:

(1) *Whereas*, the American Home Economics Association strongly feels the necessity for extending and intensifying the courses in household science and art in our high schools, and,

(2) *Whereas*, thorough instruction in such courses would require more time from the students than can be given to electives, by girls taking courses preparatory to college, and,

(3) *Whereas*, we believe that most girls of the high school will derive more value from household science and art, free-hand design, or household chemistry,

than from the compulsory study of two foreign languages in addition to English,

Be it therefore *resolved*, that it is the belief of the educational section of the American Home Economics Association that the colleges would advance the interests of our girls by the modification of their entrance requirements so as to require only one foreign language for admission, and to credit the following subjects:

Household Science and Art	2 units.
Household Chemistry.....	1 unit.
Free-hand Drawing.....	$\frac{1}{2}$ to 1 unit.
Music	1 unit.

An exhibit of illustrative material relative to the papers given formed an interesting feature of the meetings.

A very enjoyable occasion was the School Garden Luncheon given to Hon. W. M. Hays, Assistant Secretary of the U. S. Department of Agriculture, by the National Society for the Promotion of Agricultural Education and by the American Home Economics Association.

Contributions were received from school gardens literally from Maine to California. South Carolina, Texas, and Oklahoma vied with Massachusetts and Pennsylvania in fruits and flowers.

The additions to the lettuce, peas, potatoes, radishes, etc. were prepared at the Laboratory Kitchen and other sanitary eating places. The work of preparation was in charge of Miss Anna Barrows and Miss E. E. Shaw of the *School Garden Magazine* aided by an efficient corps of workers, including Miss Frances Stern of the Louisa Alcott Club, Mrs. Anna Gilchrist, Mrs. Bertha June Lucas, Mrs. Chas. A. French and several others.

Domestic science students served the lunch, speeches were made, and the 75 guests voted the luncheon a great success.

During the week about 175 persons registered at the Association headquarters, and 19 new members were enrolled.

DOMESTIC ART AS DISCUSSED AT THE RECENT MEETINGS OF THE HOUSEHOLD ARTS SECTION OF THE NATIONAL EDUCATION ASSOCIATION.

ANNA M. COOLEY.

Teachers' College, Columbia University.

Domestic art as a part of household arts has been somewhat slower in its development than the so-called domestic science subjects. This has been largely because its subject matter has been rather intangible and unclassified and because people have undertaken to present the subject who have known little about the technique and have had little appreciation of the thought content of the subject.

The importance of this field of household arts, especially in relation to future vocational development in various types of secondary schools, was realized and discussed at the recent household arts meetings of the National Education Association. The papers read were interesting and thought arousing and drew attention to the fact that in order to accomplish definite, lasting results of utilitarian value in this field attention must be given to a more logical and systematic method of presenting the subjects.

It is not sufficient to teach the girl to draft one shirtwaist or make one hat or dress; she should be taught these operations in such a way that she may realize the reasons for the various steps and processes. While this method is perhaps a trifle slower, it fully repays because of the greater gain in the long run, for the girl will be able to devise, to create, to work with initiative; there is less danger of exploiting her and she obtains correct ideas more easily with less expenditure of energy and with greater economy of time. This fact is clearly emphasized in the following papers by Miss Wilmot and Miss Bennett.

Miss Wilmot would have the girl gain a clear idea of the reasons why certain lines are necessary in making a pattern, and before any drafting is attempted would develop in a logical and systematic way the relation of these lines to the human figure. The girl is thus made able to see the reasons for the lines of the draft and not only accom-

plishes it with ease but is able to change and readjust it to suit the variations of the human form or to adapt it to the current style. In other words, she becomes a thinking individual instead of an automaton.

Miss Bennett also emphasizes the point of training the girl and developing originality and creative power. The lessons in millinery and in design as adapted to trade teaching of which she speaks show the necessity of keeping in mind the particular type of school and of so adapting work to it as to obtain the best results.

The papers read more especially concerned domestic art in different types of secondary schools—the trade, technical and practical arts high schools. The questions of subject matter and method for each of these types suggest a great field for discussion in later numbers of the JOURNAL. Perhaps a few general suggestions in relation to methods and devices for class-room management in domestic art may serve as an introduction to this field of thought and lead later to a discussion of more definite problems and devices for specific lines of work.

During the past few years, students of general pedagogy and practice have been turning their attention to the instruction and class-room management by teachers of special subjects. Perhaps none have been more severely criticised than the instructors of household arts. When one analyzes the cause for this criticism it seems to be due principally to the unsystematic handling of materials and the great lack of economy of time in relation to presentation of lessons. The teacher of sewing or dressmaking should guard against these dangers, for her subjects offer excellent opportunity for the pupils to “dawdle.” For instance, a high school pupil of average ability should be able to make a simple shirtwaist in twelve hours. If, as sometimes happens, twenty-five are spent on this single garment, something is radically wrong in class-room management and practice.

“A place for everything and everything in its place,” is a very good general rule with which to start. The workbags or boxes of the children should be carefully labelled and if possible kept in a conveniently located place. Extra supplies and materials should be so classified and labelled that they may be found with ease. A system of noting when supplies are low will guard against a general skirmishing about at the eleventh hour for a particular kind of machine needle or a certain number of thread and the consequent loss of time involved.

If the teacher has a special room for her work, she should have the

supplies most often used and such materials as she may need for demonstration conveniently at hand. If as supervisor she must travel from room to room in the school, a box for her use may be kept in each room, or one supplied with the few things she is most likely to need carried from class to class. A piece of coarse scrim (18 x 36 in.), or even unbleached muslin, with a large carpet needle and a ball of red Germantown yarn will be found an indispensable addition to this box for the quick demonstration of the method of making stitches. This cloth may be mounted in frames for such purposes or easily adjusted with thumb tacks to the wooden frame of a wall map and the height thus regulated for the use of the children as well as the teacher. In demonstrating on this cloth, the stitches should be very large so that the children at the back of the room may have no difficulty in seeing. Class demonstrations in dressmaking and millinery are great time-savers. With this help the teacher is spared the necessity of giving so much individual attention later and time is thus gained for other work.

In the presentation of lessons there are several points which, if kept in mind in planning work, will conduce to economy of time.

(1) A general outline of the entire series of lessons on a particular subject such as shirtwaists or nightdresses, if prepared before starting that subject, will keep before the teacher the subject matter which she wishes to introduce during that course of lessons. This aids her in proportioning her work carefully as she proceeds, and if supplementary discussions are to be introduced these may be so fitted into the general scheme as to produce the best results and with less danger of being entirely omitted.

(2) Some kind of plan for the lesson of the day is a necessity and a time-saver. It should be carefully prepared. Young teachers will find this worth while and a great aid in self-criticism of work.

(3) The aim of the lesson of the hour should be clearly and definitely stated so that each pupil may know how to proceed and what she is expected to accomplish.

(4) The questions asked during the presentation of the lesson should be clear, definite, logical, and thought arousing.

(5) The lesson should be well illustrated by means of the demonstration cloth, blackboard and finished articles of work, as well as by verbal descriptions and illustrations. It is wise to use as many methods as possible in illustrating, for this, too, will save time later.

(6) The teacher should be sure that the subject matter is adapted

to the particular class. Time is often wasted by presenting material for which the class is not yet prepared.

(7) Opportunity should be given in every lesson for the pupils to express themselves but the teacher should guard against digression. Needless talking and wandering from the subject of the day consumes valuable time.

(8) After the presentation of the lesson of the day, the work-boxes and materials may be distributed. Much time and trouble are saved if this distribution takes place after such presentation rather than before, as the pupils will then have their attention centered on the teacher and the lesson and not on the work in the boxes. Some systematic method of distribution should be devised as a time-saver. In a class-room with rows of desks this may be done by having a helper for each row, or in a special room the distribution may fall to two or three pupils.

Where equipment is limited, time is often wasted because of poor management. This is especially true in classes where cutting and machine work must be done in limited space and with few tables and machines. A teacher can so plan her lessons that a certain proportion of the class is perhaps basting or gathering while others are using the machines. In the same way the tables for cutting may be used by some while others are writing up notes, preparing ruffles, etc., until the time comes for exchanging places.

Much time is wasted by needless pinning preparatory to cutting. If the pinning of patterns in place and the quick method of cutting are demonstrated by the teacher, there will be a great saving of time. Children and older pupils often "putter" because of the lack of a clear mental picture of how to proceed quickly.

In many classes a needless amount of basting is demanded, especially in the making of simple underwear. In many cases if the long straight breadths are pinned carefully, basting is unnecessary and stitching can be begun at once. This does not necessarily mean poor work; a certain amount of skill should be developed.

Pupils should not be permitted to remain idle after they have accomplished the work of the day; the teacher should provide extra problems for those who work rapidly.

A bulletin board may assist in saving time and be made of great value in the special sewing room. This can be kept in order by the pupils. On this board topics of the day of interest to the class, pictures, etc., may be posted and if of sufficient worth, these may be filed and used for future reference.

The suggestions for economy of time in relation to sewing are practicable also in millinery and embroidery classes.

As a stitch in time saves time, so foresight on the part of the teacher of domestic art, as regards material and planning of work saves the time and energy which is otherwise dissipated through the necessity for much individual attention.

SUGGESTIONS FOR TEACHING DRAFTING IN THE FIRST OR SECOND YEAR OF THE HIGH SCHOOL.

RUTH A. WILMOT.

Instructor of Dressmaking, Pratt Institute.

There has been a great deal said by domestic art teachers both for and against the teaching of drafting in the high school.

It has been argued that there are patterns in the market sold at such a low price that it is a waste of time to draft, especially so as students after leaving schools will be more likely to buy than to draft the patterns which they need. It is also argued that drafting is too complicated to be really understood by high school students, and that it takes up too much time in a course where every minute must be made to count for the most possible. If the teaching of drafting is to be mere dictation and the result to be only a pattern, these are arguments of great weight; but if drafting means not only the production of a pattern, but also a thorough understanding of the construction of patterns, the relation of the lines of a pattern to the lines of the figure, and the relation of measures to the construction of a pattern and a garment, then the question is more doubtful.

Drafting, then, may mean the merely mechanical production of a pattern, or it may mean a great deal more. The amount of good which the students are to gain from an exercise in drafting depends largely upon the methods the teacher uses in presenting the draft.

Let us take for example the shirtwaist draft and see how it can best be presented. I choose the shirtwaist draft for it can be made to answer the purpose of corsetcover, chemise, and nightgown patterns. The teacher should show the students the marking off in chalk on a bust form of the principal lines of a waist pattern, waist line, neck line, center front and center back, etc. In each new step the students should take the corresponding measures on each other. Each step should be accompanied by discussion and explanation, such, for instance, as that the shoulder seam if just on top of the shoulder makes a person appear round shouldered, or that the placing of the under arm seam slightly toward the back makes the waist look slender, etc.

When, one by one, these steps have all been taken the first essential in fitting, the proper placing of the lines and seams, is learned.

Then comes the rough modeling on the form in cambric or tissue paper. This cambric pattern laid on the table familiarizes the student with the appearance of the draft.

The teacher is now ready to take up the draft itself. It will be of great assistance to her if she will make beforehand a model of red cambric on which is laid in white cambric the pattern as it is placed in the draft with the construction lines ruled in heavy black with a wax pencil. The teacher can refer to this as each line of the draft is put in so that the students may follow the process.

With this amount of preparation, the draft may be given by dictation, for the student by this time should have such a clear idea of what she is working toward that she will be able to follow intelligently the instructions of the teacher.

The teacher should draft on the board with the students as she gives dictation. It will be found of great help in so doing for her to put in the construction lines of the draft with white chalk and the pattern lines with red. This causes less confusion as it makes the pattern stand out plainly from the construction lines.

In this way drafting becomes much more than a mere mechanical process which has no value or meaning beyond the production of a pattern. The students should have as a result of this work a clear knowledge (1) of the relation of lines to the figure; (2) the proper method of taking measures and the relation of these measures to a pattern; (3) the place where the lines of a shirtwaist should fall; and (4) the grain of the material on which a shirtwaist should be cut. They will also have had practice in fitting and draping, and will possess a waist pattern drafted to their own measures.

A LESSON IN DRESSMAKING.

ANNIE L. BENNETT.

Practical Arts High School, Boston, Mass.

"Industrial education is a fad. Brains do not count in these days with either teachers or pupils; hand skill is all that is looked for in the one or aimed at with the other." Such was the remark of a prominent educator, just after the organization of the Practical Arts High School.

Is industrial education merely hand training? Is the successful teacher of manual work one with less mental ability than her fellow workers in academic branches? Are the successful hand workers in the world today men and women of merely mechanical skill, or those whose power to grasp and reason out problems makes that skill a greater factor in success? Is there even in the "first class" dressmaker a something which the one who comes a little short of success lacks? Is it an inborn "gumption" which can neither be acquired nor developed by a course of mental training that makes the one able to originate ways and means of accomplishing results which the other admires but cannot follow? Is there in each particular division of the great subject of industrial education a means of training both brains and hands, or must we depend upon academic work for the former and be satisfied with the latter for our own share in the pupils' development?

The lesson I shall suggest as throwing light on these questions consists of a series of problems worked out by the pupils of a dress-making class near the beginning of their third year in the high school. These pupils had had one year's previous training in this vocation line, which gave them practice in drafting, cutting, fitting and making shirtwaists and simple seven and nine-gored skirts of washable materials, and had in this second year of their trade already drafted, cut and fitted tight waist linings. With these drafts as a foundation the following problems and their immediate results made up the remainder of the year's work.

The latest imported seven and nine-gored skirt patterns having been obtained, each in three sizes, the pupils applied directly to them their system of drafting, and by careful drawing, measuring, and comparing the results with patterns drafted by them the year before in the same sizes, were able to note the changes in style that had taken place during the year, in the division of breadths, amount of spring to the gore, and width and placing of the flares. Then by careful comparison with dimensions of the different sized patterns a new set of rules was evolved to suit the prevailing fashion, the fundamental principles, however, of fitting hips and waist and determining lengths and curves remaining the same.

As one of the characteristics of the seven-gored skirt draft this year was an uneven division of breadths at the hip line, the pupils' ingenuity was more heavily taxed when each, using that as a basis, was given a separate design from the fashion books, calling for an entirely different division of breadths, from which she was to make a paper model to a scale from her own measurements, true in line and proportion. Much care was taken in the selection of these designs in order to give as much variety as possible to the work of the class. Some had equal front and back panels, others side breadths of equal widths; some called for plaited skirts, others for combinations of plaits and plain breadths. There were circular skirts with plaits and without and skirts of two, three and four breadths; thus each student, besides having the practice in working out her own problem, could benefit from the experience gained by her companions on those entirely different.

Finally came a study of the modifications of either the waist or skirt patterns or both that would be necessary in order to carry out the individual design and give at the same time the continuation of lines with beauty of curve and proportion which would make the dress a unit as pleasing as that of any beautiful work of art.

THE TEACHING OF MILLINERY.

CLARA S. GAY.

Practical Arts High School, Boston, Mass.

Our desire in the newly established High School of Practical Arts in Boston is to give the girls a real business training. The work in our department is given to them as if they were apprentices in a hat shop. The proper handling of the tools is the first important step. Then follows the measurement and construction of buckram and wire frames and the making of the hat, the covering of these frames with velvet, silk, straw, braid, net, chiffon or lace. The last step to be taken in the first year's course is simple trimming.

Before entering into the discussion of these processes there is a suggestion concerning the class room for millinery. We find it necessary to furnish the room as nearly like the work room of a regular hat shop as possible, giving the girls tables where four or six may work, low chairs, and foot stools. There must also be places to keep the work, and we have found the milliners' heavy hat boxes, which are like large drawers, very satisfactory. With some hat stands and a mirror the work-shop is equipped.

When the girls are ready for work we have a talk on the use of cutters, pliers and milliners needles—the last a source of surprise and annoyance on account of the length. We soon settle down to real work, that of cutting and making bandeaus of buckram and of wire of different kinds and sizes.

Next, a start is made in the cutting and making of folds. This requires more thought than the girls realize, for there is to be considered the true bias which is so necessary to make a fold fit well. Not only is there the true bias, but the fold has also to be cut on the ends and pieced with a firm, neat back-stitch, or the seam will full and pucker when stretched on the hat. Again there is the nap to be considered; it often happens if one is not careful that the nap of one end may run in one way, and the nap of the other in the opposite direction, thus making the shade of the velvet very different. After the piecing is carefully done, the strip is neatly catch-stitched and

then, the work on the milliner's folds, pipings, puffs, shirrings and other finishings may follow.

We are now ready to take up the buckram frame. The individual girl ascertains her own head size in order that she may have experience in fitting such as she would have in a regular shop. The width of brim is determined and whether it is to be rolling, straight or drooping. A paper pattern is cut according to dimensions, then placed on the buckram, which is cut and lapped on the edge to form the upward or downward curve of the shape desired. When the proper lines and curves are effected we proceed to wire, bind and cover the frame with wadding or crinoline, whichever the material to be used will require.

Then the circumference and height of the crown is thought of—whether it is to be large or small, tapering or square. The best proportions relative to the brim and the becomingness to the wearer must be determined.

After the crown is adjusted we are ready to cover the upper part of the brim. As a rule it is best to have the inexperienced girl first fit and cut a pattern of tissue paper, from which she may cut the covering to be used on the brim. This pattern is placed on the velvet with the bias in front or at the highest roll of the brim with the nap running diagonally back; it is fitted and pinned carefully with all wrinkles drawn out and then sewed over the edge and into the head size. The under brim is covered in the same manner and the edges slip-stitched together. A fold or covered wire is placed on the edge of the hat to finish it. The crown is covered and finished at the lower edge with a plain fold and bow, and the hat is then lined carefully.

This completes the foundation hat. By this time the girls are ready for something new and even a wire frame is welcomed with joy. Several models are given the girls to copy that they may have some choice and a variety to work from.

When we come to covering the frame with straw, interest in the work increases, and the girls are happy, for like many of us they rejoice to see quick results.

The first straw hat must have a fancy mull facing for practice, and the question arises shall tucks be used—one tuck or two or three? Or shall cords be employed, large or small, or wire?

Then there are shirrings, which are so pretty in clusters or several rows, or again, combinations of these may be used. The pupils choose for themselves, and this first work is generally very good, some careful students producing really excellent work at this stage.

They are now ready to do some work for themselves. They usually find a picture of a frame which they reproduce, or they copy from memory a hat seen in a window or on the street.

By this time the pupil has heard in her art work much about harmony, color and rhythm; she has learned to consider her suit or coat in selecting the materials for her hat, and she has grown aware of the importance when choosing a hat of giving heed to the shade and dressing of her hair, the color of her eyes and complexion—the shape of the hat and the trimmings for it. Moreover, she has had her attention called to the appropriateness of hat and costume for definite occasions.

All of these points having been carefully studied, she is able to decide more intelligently this really important question of suitable head gear.

By the end of the first year all those who do not seem able to sew well or trim with ability should be advised to take up a new kind of work—they will not make a success of millinery.

The teaching of trimming is another matter—that the girl has to do for herself, with suggestion of line, rhythm and value of colors. We know that a hat trimmed with ever so much effectiveness is not valuable unless made with the utmost care and neatness; often the making is the principal part of a hat of this day, with just the right touch to finish it. For what milliner of high standing would send out a hat, no matter how chic, if it was not made properly? For this reason the greatest care must be taken in the part of the work dealing with the making.

These steps in the progress of making and trimming are repeated each year of the course, with more and more difficult problems dealing with mourning work, fur hats, lace hats and other characteristic features of the millinery trade.

We have girls of many types and dispositions, and find their city life lacks many privileges their mothers and grandmothers had for *home* training in domestic arts. We feel the need of this same training for them, as well as an intellectual one, to fully develop their characters. For this reason the Practical Arts High School of Boston has been established.

These girls who have worked at millinery have certainly gained patience in the first dull work in buckram wire and folds, and they have gathered knowledge of grace, and artistic lines and of the beauty of proper coloring; they have learned the values of material and the art of combining.

TEACHING DESIGN TO TRADE CLASSES.

GRACE W. RIPLEY.

Girls' Trade School, Boston Mass.

Four trades are taught in the Girls' Trade School of Boston, millinery, dressmaking, machine garment making, and machine hat making. From the beginning of her course a pupil works in actual trade shops where order work is done for discriminating customers. One year is the usual time taken for learning a trade. Besides the trade work, each pupil studies business English and arithmetic, design, gymnastics and cooking. Two periods of one and one-half hours each are given to the design work.

The first object of the design course is to give the pupils an opportunity to supply the designs needed in the trade shops of the school, and by so doing to gain experience on the creative side of this work.

The pupils work very hard so that they may get a design accepted, and are proud when their work is pronounced of a salable quality. Some pupils are able to make salable designs as soon as they learn the special requirements in making designs for different materials. Two special design classes were formed last year for talented girls and these girls made even the most difficult designs needed in trade work.

We use the same elements in design that are used in the needlework, tucks, featherstitching, French knots, embroidery units, bands, hems, yokes, cuffs, panels, braid, lace, silk, etc. The pupils are taught to make combinations and selections, and their best ideas are used on our children's garments, underwear, waists, skirts, hats, etc.

The design work is closely related with the trade work. In the underwear department the girls design underwear, in the waist department, waists, etc. It helps very much in the beginning to work out many problems in tissue paper and to lay actual tucks in the paper and represent hamburg, lace, featherstitching and embroidery in Chinese white.

One of the most helpful and interesting things that we do is to make simple patterns, and this we do in almost every lesson. We begin by folding and cutting circles of different dimensions, then

ellipses, etc. Some pupils cut many circles before they can feel the curve. We cut patterns of yokes, stocks, jabots (plaited and plain), belts, cuffs and collars. We have dressmaking forms which are in constant use, and besides using these, the pupils cut patterns for each other. Often the pupils are given patterns to correct or make over.

We have done a good neckwear business this year. All the neckwear was designed, stamped on cloth and made entirely by our girls. We found it very difficult to keep our prettiest models on hand, as they sold so quickly. A showroom containing glass cases was established last year, and this is kept in order and made attractive by different girls in turn. Whenever our stock of neckwear runs low, paper models are put into the case, so that people may order from them. The models are so pleasing that people often want to buy them thinking them real.

I believe the taste of the general public is constantly maligned and that people really prefer pretty to ugly things. What people do not like is a thing that although perhaps faultless is without charm. A trade school pupil often presents a design which is not bad and we sometimes put the responsibility on the public, saying "Put it into the case for a few days and see if it will sell." The neckwear designs which have sold best are the ones which had either individuality of shape or charm of decoration. A fine linen jabot without decoration but with long points sold as fast as we could make it, to the great delight of the small designer, who cut the pattern after having attempted several dozen which were correct but entirely uninteresting.

We use quantities of light weight brown wrapping paper and white tissue wrapping paper for our cutting work. My rag-bag is also in constant requisition. Some of the finest dress-makers of the city send us scraps from their work rooms. The larger and finer pieces are used by the millinery girls in making silk ties and this gives them an opportunity for extra practice in handling and combining materials and tying bows. We use these scraps constantly in our color study, which consists of exercises in matching and choosing combinations with reference to beauty, utility and appropriateness.

Some pupils have a natural color gift which enables them to make beautiful color combinations by instinct. These need merely a chance to exercise their powers, but others need much training before they can make even passable color combinations. Last year a mull tie of simple design was embroidered in seven or eight different colors of

Persianna and we watched the selling qualities of the different colors. Our customers usually bought the ones we considered prettiest.

Our millinery girls also made designs for bands of braiding and embroidery and ornaments which were so fashionable this year, also chiffon and silk roses for ornaments. This gave them excellent practice in handling materials, combining colors and making designs.

The necessity of economy in design is an important lesson for a designer to learn. An order of a design for a chemise was given to a girl, who in a short time presented a good design containing 134 dots. For the price to be paid we could not afford to embroider so many dots and the pupil simplified the design to 74 dots, then to 34. The customer was much pleased with the final design. A great majority of commercial embroidery patterns could be simplified without hurting the effect of the designs.

It is impossible to take the trade school pupils to the stores very often, so we bring the stores to the pupils by weekly exhibits loaned to us by the best stores of Boston. From these exhibitions the pupils make selections and get inspiration and new ideas.

The girls employed on machine-made hats made plasterline models for dolls' hats half the size of the large models used for blocking and pressing hats. The plasterline models were shellacked and used. The girls gained training for eye and hand and at the same time made useful things.

A designer is a necessity in a machine-operating factory. The methods of making machine operator designers are taught in an elementary way to our machine garment makers, in the hope that they will take an intelligent interest in the creative side of their work and strive to advance themselves in their trade. When a pupil begins to volunteer ideas upon the constructing and ornamenting of our products, we know that we have begun to succeed with her.

On the last three days of school there were no design lessons, yet the design room was full of pupils working hard on designs to use in the summer, and going ahead mainly without help or criticism. A little Italian girl made a design for a Dutch collar on Friday, embroidered it on Saturday, wore it to school on Monday and took about twelve orders from it before Wednesday. She showed that she had imagination and the initiative to carry out ideas. She is one of those who makes us sure that the study of the trade design is very much worth while.

PRACTICAL METHODS IN A HOUSEHOLD ARTS LESSON.

EMMA S. JACOBS.

Director of Domestic Science, Washington, D. C.

Out of the whole list of lessons in household arts, I have chosen the one on making a fire, and hope to show how to present the materials direct the attention of the class, secure the interest and activity necessary, and teach not only the art of making the fire, but also the principles on which the making, the keeping, and the control of the fire are based, and their application elsewhere in the home.

As an introduction to the lesson, let there be a discussion of the object of the assembly of the class in the kitchen or cooking school or the presentation there of a range. Let the questions be definite, and of such a character as to secure from the pupils a free response, that a certain degree of sympathy may be established between the teacher and the pupil, that the teacher may discover the store of experience and knowledge in the possession of each pupil, and that this store of experience and knowledge may be set forth. The discussion should show that heat is needed to develop flavors and otherwise prepare food to be eaten, that different materials are used to produce this heat, that these materials are burned, and that some of them require stoves or other apparatus of special construction for the combustion.

Now show by experiments the conditions which govern and control the burning of fuel. For these experiments have a candle, matches, cardboard, thick felt, narrow strips of wood, a tumbler, a wax taper, and lime water. Give no suggestion of the results to be obtained. Try the experiments beforehand to be sure the desired results can be obtained. During the experiments, direct attention to the materials used, what is being done to them, and the results obtained. Let the pupils describe all this in their own words, but do not hold them in too rigid control or direct attention too closely to the spoken word. Then lead them to draw conclusions, which, when stated in formal language, will be the principles desired.

Such points may be taught by the experiments as that the candle stick must be warmed, and the fat melted by holding a lighted match against it, before it will burn, that the match will not burn unless it is rubbed on a rough surface which warms it; that most fuels must be warmed before they will burn, but that some will take fire when warmed but slightly; that the candle will not burn, unless air reaches it and the products of its own combustion are removed.

The presence of carbon dioxide can be shown by the taper and lime water. Children will remember this though they do not understand it, and the teacher will later be able to show the production of carbon dioxide with baking powder and active yeast.

Now show a range constructed of glass and compare its parts with those of the coal range to be used. Demonstrate the passage of smoke, carrying steam, carbon dioxide and other gases through this range, by introducing a smoke producing material below the fire box. After this let the pupils proceed to build a fire of wood in the steel or iron range, then by changing the arrangement of the various slides and doors in this range, let them prove what has just been shown in the glass one. They will learn that the smoke takes the most direct course to the chimney; that when the opening below the grate is too large, the smoke will escape through the cracks into the room, instead of into the pipe; that when there is obstruction (as soot or a damper) in the pipe, the smoke will pass out into the room; that when the opening below the fire is too small or there is obstruction in the form of ashes in the pit or below the fire, the material will smoulder and not burn; that when the opening to the pipe which is nearest to the fire box is closed by slide or otherwise, the smoke will pass over and around the oven, seeking the other exit to the chimney and so heat the oven; and that when this opening is closed the material burns more slowly.

We are thus able to teach that by having a short or direct draft, we cause the fire to burn briskly, and that by having a long or indirect draft, we cause it to burn slowly, but at the same time save fuel and heat the oven. We can also teach that the object of the various slides and doors is to increase or decrease the supply of air so we may control the burning of the fuel and regulate the distribution of heat.

During the building of this fire, let the pupils determine the reason for cleaning all ashes from the range, for placing the pieces of fuel lightly on one another, and for keeping the fuel below the level of the top of the fire box. Show when and how to blacken the range,

and let them do it, as well as other work connected with making the fire, such as cleansing the tea kettle, putting freshly drawn water in it, and sweeping the floor around the range. At each lesson following this have at least one pupil attend to the fire, and give reasons for what she does.

The next step is to apply these principles to the ventilation of a room. They will readily understand that we are in a measure like the candle or the fire. We need oxygen, and produce carbon dioxide which must be taken away. The best position for the inlet is at the floor line or just above it, and for the outlet at the ceiling or near it; moreover, there is more rapid change of the air if the inlet and outlet are on opposite sides of the room. Other applications of the principles taught are found in slow heating of materials, spontaneous combustion, putting out fire, and the action of individuals when there is a fire.

It is not necessary or even desirable to go into minute details or explanations involving terms used in physics and chemistry. Demonstrate the facts in a simple impressive way, draw the most obvious conclusions from them, and establish rules for action, then when these pupils reach the high schools they will readily grasp and understand the reasons for these things.

The materials we have used are interesting, they can be easily handled, even the children securing good results. Many a child has proudly shown to those at home what he has done or seen done at school along this line. Though the children may be familiar with the materials used, and to some extent with the facts brought out, yet during the experiments the mind can be led by skillful questions to reason back to cause, to fit cause and effect, and they will answer many of their own questions. Moreover, through some such method of presentation, the child is shown how to collect and analyze material which comes under his observation, and to draw conclusions or deductions therefrom, which may become the governing principles of action.

These pupils are passing from the stage where they are so largely controlled by impulses; their inhibitive powers are becoming stronger, ideas are held in consciousness long enough for contradictory suggestions to arise, and they begin to weigh things and to act with deliberation. They are passing from childhood to maturity, and if they are to help and to receive help from their fellow men, they must be able to observe accurately, think rapidly, and act decisively and effectively.

Much of the teaching in the manual arts leads to such results. Teachers of these subjects have a mass of material primarily and inherently interesting to children, which can be utilized to educate them. Therefore, thought should be given to the best means of presenting it to secure the development of the children, or to inform them, using the word in its etymological sense of "shaping from within."

DOMESTIC ART: ITS CONTENT AND POSSIBILITIES.

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Because of the wide-spread feeling that the home exerts an almost unbounded influence upon the persons living there and that through these persons it has certain powers for good or bad in a community, and because of the growing use of the school as a social center not only during school hours but also at other times, the sociologist, the educator and others are seeking to bring about in these two centers conditions which will be conducive to right living and right thinking. Already have we made progress in the subjects relating to the sciences and are therefore on the way to more healthful and sanitary surroundings. Let us consider, along with these, the making of our habitations more beautiful and attractive to live in, and so round out the plan by which the individual is to be better able to live a happy and efficient life.

Our sense of beauty may be innate by inheritance, education and practice, but as most of us do not seem to have inherited a completely developed sense in this direction, we must acquire it by the latter methods.

It would seem that we have become accustomed to think of art as far removed from ordinary things which we see around us at all times and among which we have most frequently to choose and to judge, for people are constantly building houses and decorating them, selecting furniture, floor coverings and other things necessary, or thought to be so, in the furnishing of a home, planning dresses and making or selecting hats, apparently without thinking that these belong in any way to the field of art.

To my mind, domestic art should consist of the study of the principles of color and design and their application to hygiene and economics, to the home, to the individual in the home and, indirectly to the neighborhood and to the town. There are such splendid opportunities for the utilization of the principles of color and design in connection with every-day life, by applying these laws to the things

about us that we should be able to learn to discriminate, to gain a foundation for our judgments and gradually to acquire an appreciation for the beautiful which will react on our surroundings and associates.

In the first place, I believe that courses dealing with color and applied design, very closely correlated with domestic art, should be required of every one taking work in domestic art. These courses are not intended to make designers and colorists of the student but to give her a better understanding of the principles of design and color and a foundation upon which to base her judgments, a standard being as necessary here as a foundation knowledge of certain basal sciences before taking up dependent subjects. If instruction in design and color is not available in an art department, it should be taught in the domestic art course. In the second place, to begin as early as possible in the life of the child and to continue through her school age with work in color and design would seem to me necessary in order for her to develop such love for the beautiful that she will try to produce it in the things she makes and in her surroundings, and in order that she may also acquire powers of discrimination and habits of exercising these powers.

In the high school domestic art may be correlated with mechanical drawing and the decorating of furnishings planned for the original house designs made in this department. The pupils should be able to discriminate and judge for themselves whether or not the design of the furniture adheres to the law of appropriateness, whether or not the decorative design follows the construction lines or destroys them through its ornateness or exaggeration of curves, and whether or not the designs on different parts of a piece of furniture are harmonious. The pupils should be able to work out their color schemes according to the laws of analogy and contrast. They should know that some colors reflect light whereas others absorb it, and they should consider this in papering rooms having different exposures. They should be able to judge for themselves the effect of large bold figures and naturalistic designs in wall paper which is to be used as a background for pictures and furniture. They may then be able to experiment with the use of vertical lines in paper and draperies or the use of horizontal lines in dadoes, borders and hangings. They may decide for themselves as to the sanitary and economic advantages of different floor coverings, and will see that in selecting them the sequence is more pleasing if the darkest tone in the color scheme is the floor, with the walls next lighter and the ceiling lightest of all.

One point in regard to furnishing which must be dwelt upon is that of fitness to purpose. How often we think things belonging to others are what we should have and buy them only to find that they are not at all suitable for our purposes. Another factor to be considered thoughtfully is durability. A well made piece of furniture with good lines and suitable to the purpose for which it is used, is always preferable from the standpoint of beauty and economy to the more elaborate, cheaply ornamented and glued-together pieces which we so often see. A splendid opportunity to exercise the powers of discrimination of the individual is in observing things around her, good and bad, and in forming judgment concerning them.

I have not said very much about the subject of dress, for I feel that that phase of domestic art is fairly well developed as far as the making of garments is concerned. Besides teaching the sewing we must at the same time help to form ideals and habits of thought based on the laws of appropriateness, economy and hygiene and the principles of design and color in connection with clothing. This law of appropriateness is one that cannot be too carefully emphasized and discussed. If we are at all observing we see that many people disregard the influence that occasion and occupation ought to have in deciding the design, material and cost of dress. We see women doing their work about the house or visiting on the front piazza in kimonos. Some even venture to the corner shop in this apparel. We see women in the street cars in gowns that are appropriate only for those who can ride in their carriages. We see shoppers attired as for a reception. Why do so many school girls dress as though they were going to an afternoon tea, with fancy silk or net waists, short sleeves, picture hats, and high heeled shoes, and in cold weather with low slippers and lace yokes which furnish almost no protection? Why do we see little children attired in silks with much lace, many ruffles and jewelry?

Do these conditions and the many others that readily come to mind show much judgment in regard to the laws of appropriateness and economy? Do they show much regard for the principles of design and color? We all agree, I think, that they do not, but why is not better judgment shown? To me it seems a question of *ideals* and the training, or lack of it, necessary to assist in forming the proper standards with reference to these matters.

In giving these suggestions to the content and possibilities of domestic art, I have not tried to outline a definite course of study.

Each of us must work out the details for her own school according to conditons. I have presented what I consider the most important phase, that of art, on the knowledge of which our judgments and tastes ought to be based, and from the standpoint of which a child should begin early to observe the things in her home, in her school, and all about her, in order that she may know how and where to find and create beauty.

That it is st ll with us an effort instead of an instinct to make all things beautiful, is very evident when we think of the exaggerations in dress of the past year or two and the furnishings of our homes. It is encouraging, however, to know that women in the homes and in the clubs have taken an interest in the reorganization of the present scheme of dressing and in the simpler, more useful and hygienic furnishings of the home, in order to add to their own comfort and happiness and to contribute to a better and more reasonable way of living.

HOW TO MAKE THE HOUSEHOLD ARTS EFFECTIVE IN THE SCHOOL AND COMMUNITY.

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I can only talk from the supervisor's point of view. Here in a meeting of this sort we want to learn something which we can go home and try, and we Californians in particular always want to work things out. I think that we cannot overestimate the importance of interesting the community. Unless we make the mothers, fathers, aunts, and cousins just as interested as the children are, our work will not be far-reaching in its results. We do not, however, always have sufficient money to work out our plans and we sometimes lack the sympathy of the grade teachers, principals, and superintendents.

Now, one thing we have to do as teachers is to win the people with whom we work, and there is nothing truer than that if we win the children, we win public interest. The only way I think of to make household arts effective in the schools is to make them practical, but we must adapt the work to our communities. The children in our schools or in our own homes, being interested in dolls, will take delight in making dolls' clothes. But do not forget that children are children. Do not make them do great long things, but give them short and practical work which they can easily and quickly finish.

Try to help the grade teacher to carry this spirit into her work. I like to think of the household arts as the home work. That is your problem. If you have thought that you were a special teacher, try to say to the grade teachers, "Let us work together." Having the children make reports and send them back is a good idea. We cannot make reports and correct them, but we can inspect and keep track of the work. We should go down in the lower grades, and begin with the eight and nine-year-old girls. Have them sew, not sample stitches, but real stitches on real cloth, muslin, calico, or whatever it may be, so that they may recognize hemming, back-stitching, etc. Is it not well to have these girls who so early leave school, leave able to take care of themselves and their clothing? People suppose

that children do not care about their personal appearance, but the children, beginning with the lower grades, may be made to care. We want to give the children a much larger horizon. Not until we have practically all of the people in the public schools appreciating what handwork means, can we have the handwork gain the high position that it needs.

A speaker who preceded me spoke of the interest which the people in the different districts, especially the manufacturers, take in such work. The thought that I want to leave with you is, that when you are given the great opportunity of going intimately into the child's life, make the most of it. Be mothers, grandmothers, aunts, and cousins to every one of your children. This will pay in the end, for the moment you catch one child in your net the influence will spread, and you will soon have all the children.

THE TEACHING OF METHODS OF HOUSEWIFERY IN SECONDARY SCHOOLS.

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The Standard Dictionary defines housewifery as "the part of household management coming under a woman's direction." We may well ask what part of such management does *not* come under her direction and who will manage any part, if the woman does not?

The teaching of any and all subjects of housewifery should include a presentation of the facts underlying the process whether these facts be the contribution of physics, biology, art, economics or what not. These facts should then be carried out in actual work or practice. *Knowledge* applied creates *power*; power repeatedly exercised ends in *skill*. The first two, the ordinary high schools should strive to give in as large a measure as possible; the last cannot be attained in them to any high degree.

We shall probably agree that an ideal house is that one which provides a healthful, beautiful and economically-conducted environment for the family life. Such a house forms the middle of three concentric circles. It is the closest environment of the clothed human body and may make or mar its welfare. On the other hand, its efficiency depends largely upon the perfectness of the larger and more distant environment—the town, city or country, even the world.

The end of all housewifery should be the highest efficiency possible to each individual. For this end *health* should be sought. The healthful house is the clean house—a house filled with a plentiful supply of clean air and sunlight. Its furnishings must not interfere in number, style, color, or material with these fundamental factors of health; at the same time they must please the eye and be in harmony with the available capital of time, strength and money.

Since perhaps more time and strength are used in removing *dust* than in any other one process of housewifery, this process will serve as an example of method.

The mind of a high-school pupil should be ever ready to ask: "Why?" Why, then, should dust be fought?

As housewifery is preëminently applied science, high school pupils should look to their entire study of bacteriology for the answer. Bacteriology is the science which most firmly underlies the study of cleanness and nothing can quite supply its place. However, "dust gardens"—to use a descriptive common term rather than the technical name for plate cultures of dust—will alone furnish a sufficient basis for the answer. They make clear that in common household dust there are living cells capable of growth, of reproduction and the production of chemical changes. These changes may spoil our food or furnishings, thereby causing economic waste; or they may, in our bodies, cause discomfort, disease and possibly death. Because of their omnipresence, their invisibility, and their rapid multiplication, methods of *prevention* should be studied first in order that their removal may be ascertained and made as easy as possible.

Prevention consists in furnishing few lodging places for dust—smooth non-absorbent surfaces in finish and fittings; in providing conditions unfavorable for growth, floods of sunlight, change of air, absence of exposed food, dryness and cold. With due attention to prevention and removal there will be little need of disinfection, which is the making harmless that which has not been or cannot be prevented or removed.

The removal of dry dust includes the two common processes of sweeping and dusting. What do we sweep, and why? Floors, will answer the first question and the why is the general answer of sanitation—to ensure the prompt, rapid and complete removal of all dirt.

Dirt on floors consists of (1) litter—bits of paper, threads, etc., that should not be there; (2) grit and street filth—that should not be brought into the house on our uncleaned shoes; (3) fluff—the *débris* from the wear and tear of fabrics—the more fabrics, the more fluff! All of these are laden with bacteria, molds and occasionally with wild yeasts.

If sweeping results in throwing this visible and invisible dust into the air, it is not removal but simply a change from one place to another—like all blowing, beating, shaking and brushing. The *purpose* of sweeping is to gather together coarse dirt with the attached dust, that all may be removed from the house. The *aim* in sweeping should be to raise or scatter as little dust as possible into the air, for this must settle again and is therefore not removed.

Rough surfaces, as uneven floors and carpets, hold the dirt and dust tenaciously. A somewhat inflexible, stiff implement, as a broom,

is necessary to reach into the depressions and among the fibers to dislodge the dirt. This broom, if dry, snaps and so throws dust; if damp, it will *hold* the dust without scattering so much. This is the simplest application of the universal principle that damp surfaces hold dust.

A broom used on loosely woven carpets pushes the fine dirt through, where it remains on the floor beneath to be ground into powder and returned at every footfall. Such carpets are difficult to sweep in such a way that the dirt may be collected from the surface without being pushed through. Pile carpets or rugs hold the dirt on the surface or lightly in their meshes. The broom should not, then, be pushed down too heavily, for most carpets are not over one-eighth inch in thickness.

With proper attention to sanitary habits and preventive measures, smooth-finished floors need little if any sweeping. Litter may be picked up by the hand or taken from its place without sweeping the whole floor by using a small broom with a long handled dustpan. This method is equally good or even more effective on carpets.

If much grit is present, a soft brush should first be used on polished surfaces. It does not scatter dust so much as a broom and its stroke is a push instead of a pull. The pupils should study the mechanical advantage of this. Mattings should be treated as nearly like bare floors as possible. A broom should not be used upon them.

Sweeping lessons should consider and illustrate the dress of the worker. This requires smooth, washable fabrics so made as to allow unrestricted use of the muscles, and protection also for the hair and nostrils. Here may be applied the principles learned in the study of textiles, dyes, design and in laundrying. Such lessons must also include attention to the position of the body in order that energy may not be dissipated and wrong physical conditions result; the position of the hands on the broom handle, with thumbs opposed; the stroke or leverage—a pull not a push—and which should be in *front of*, but not *toward* the worker: the short, light, wiping overlapping movements necessary to prevent raising dust and pushing dirt through; the stoppage of the broom on the floor and not in the air, to overcome the inertia of the rising dust current; the use of both corners and both sides that complete efficiency in wear may be gained; the cleaning of the broom by removal of entangled hair or fluff and the washing away of collected dust, with cautions as to rotting of the stitching and rusting of the mount; and finally, the proper drying and storage to ensure cleanness and

full return in service. A second application of the scientific fact that damp surfaces hold dust is given by the use of "dust catchers"—damp pieces of paper, damp coarse shavings, anything that will not stain the carpet or allow bits to remain in the meshes to mold or sour.

The gathered dirt—sweepings—must be taken up. For this, use the damp covered dustpan which shows the third application of this principle. This is prepared by covering the dustpan with a piece of wet newspaper fitted to its flat surface, but standing up as far as possible at the back and sides. The dust caught on the back will show its useful purpose. This is of prime importance in sweeping stairs for here the worker's face is directly over the rising dust. Stair sweeping emphasizes also the need of covering the nostrils.

Sweepings should be burned, for fire will safely dispose of all dangerous micro-organisms. The damp paper when wrapped about the sweepings furnishes neat removal and safe storage, if they cannot be burned immediately.

A carpet sweeper is a brush with broom action enclosed in a box which serves as a dustpan. The movements, methods of cleaning the brush and box, as well as its storage should all be considered in relation to cleanness and economy. Its proper use on carpets and rugs obviates the pushing of dirt through or into the fabric and prevents raising dust into the air. Wisely selected and used, it is an economical, efficient and sanitary dirt remover; improperly used or cared for, it is inefficient, uneconomical, and may become filthy. As it cannot clean the edges of an all-over carpet, its use here is not as completely sanitary as it is with rugs. The edges must be cared for by the use of the broom in order to remove the dirt, discourage insect pests and prevent marring the finish of the room.

Sweeping is the most dust-spreading process of all housework; therefore there should be as little of it as possible. The "dust gardens" will show plainly that sweeping should not be done while food is being prepared or served; that whenever it is done, accessible food should be covered, and above all, that in order to attain cleanness the dust which sweeping always raises must be allowed to settle thoroughly before its removal by dusting can be accomplished. This will be well shown if one "garden" be planted immediately after sweeping and another after the lapse of some hours.

No house is clean so long as the air is laden with dust. The cleanest house, therefore, is one where little sweeping but much wiping of floors is done.

Dust is not removed from the house by whisking a feather duster or flinging a cloth over surfaces or even by wiping it into a cloth which is then shaken in the room or stored in a dust-bag to be used again and again until—who knows? The ordinary dusting allows still another application of the principle that dampness holds dust. A soft, rough, absorbent cloth or similar material, not linty, must be chosen and the dust wiped up into it, the dusty portion folded over and a fresh portion used. Dampness may be given by either water or oil. A properly dampened duster will not injure polished surfaces. Injury results from too much moisture or a too dirty cloth. After washing, the dust-laden cloths or mops need thorough drying before they are stored, for no damp, dust-laden article should be stored in a dark warm place, where conditions are favorable for fermentation.

Sweepings burned and dusting implements washed ensure, through fire and the sewer, the final removal from the house of the invisible living organisms of decomposition and disease, as well as the dead animal and vegetable matter and mineral grit on which they are carried about.

These two methods of disposal are typical of all methods in housewifery. They show how through housework there may be a daily application of physics, chemistry, bacteriology and other sciences. Properly done, housework becomes one of the best means of physical culture. It also furnishes almost unlimited opportunities for the study of values in manufactured articles and their relations to industry and social conditions,—all of which are factors of economics. Above all, the study of housewifery should prove that “any necessary work may be greatly done.”

The end sought—complete efficiency in human beings—raises the business and profession of housekeeping to a plane far removed from drudgery.

THE "HOUSE COURSE."

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The chief purpose of the work in Home Economics in our high school is to show to the pupil the importance of the home, to arouse interest in its work by giving familiarity with its common processes and their underlying principles, to indicate the relation of the home to the community, and to develop a sense of civic responsibility. The study of food, shelter, and clothing affords an opportunity to present some of the economic and esthetic as well as the scientific problems involved in the management of the household, and to give through these a sense of values, a standard of living, and a control of the common materials with which one deals in the home. The study of the house itself, or as we call it our "house" course, opens up the discussion of a great many of these problems.

This course has been the most popular in our high school work in Home Economics. It meets five single periods a week, two of which are devoted to work in household art.

The following is a short outline of the course.

A brief study of the early human habitations and a comparison of the homes of other people with those of to-day.

The development of the American house, including the study of the New England and southern Colonial homes, and the home life and occupation of that time; a comparison of the home life of a hundred years ago with the home life to-day; reasons for the changes that have taken place and are taking place now; effect of changes on home life.

Some problems involved in the building of a modest house: (a) the selection of the site; soil, drainage, surroundings, accessibility, improvements; (b) the drawing of house plans adapted to the site; (c) the cost and relative value of building materials; (d) the construction of the house; cellar, foundation, walls, and roof; (e) heating, lighting, and ventilating; a study of various systems as to convenience, cost, and efficiency; (f) the plumbing system of the house.

The decoration and furnishing of the house considered as to sanitary value, artistic value, quality, and cost. This is a direct application of the work in design.

Care of the house from the sanitary point of view.

The care of textile fabrics including cleaning and removing of spots and stains.

Some of the problems involved in the maintenance of the home, such as division of labor, domestic service, apportionment of the income, and the relation of different members of the family toward each other.

The housing conditions in Chicago, what is being done to improve these conditions, what is being done to elevate the home life in the crowded districts, and our responsibility in connection with some of the civic problems of the day.

The art, in connection with this course, includes a brief study of decorative designing, involving the principles of applied art in its relation to the home. The problems of proportion in space division, of balance, flow of line, harmony of shapes, rhythmic repetition are studied as they are encountered in designing curtains, table and pillow covers, pottery, lamp and candle shades. Both the design and its rendering in actual material are made with the purpose of developing the originality of the pupil and of teaching her the rules and principles that govern the expression of her own idea.

The pupils are allowed five or six thousand dollars for the building of the house. The price is limited for two reasons, first to simplify the work and second to show what can be done for a sum which seems to these girls a very small amount. By the time their house plans are completed they are ready to apply their work in color and design to the decorating and furnishing, studying here the influence of Burne-Jones and Morris, to whose joint efforts are due the complete revolution in decorative art during the last half century.

All the time this is being done, each has in mind a definite family which is to occupy this house. Usually it consists of the father, mother and two or three children.

Many of our girls come from wealthy homes and have very little idea of the cost of running a house, only one or two suggesting the possibility of getting along without a servant.

In discussing the question of clothing the girls made lists of what was necessary for the different members of the family. Some who had an allowance and had kept their accounts for years, had definite data on which to base their estimates of cost. The figures varied all the way from two hundred dollars a year for the woman's clothes up to six and eight hundred. Their estimates were discussed with much spirit, each one trying to defend her own.

Consultation at home changed some views. One girl came back and said "My father thinks a woman does not need six hundred dollars a year for clothes, she can dress very well on four hundred." So one estimate was changed.

Then the question arose, If you spend so much a year for clothes what ought the income to be? They found by applying the ideal divi-

sion of the income that the father in that home would need a large income. This led to the discussion of the incomes of the various classes of people. They were surprised to find that \$2000 a year was above the average for the university professor. They began to realize that many people to whom books, education and at least a limited amount of travel were necessities must divide their income in such a way that a minimum amount must be spent for food, clothing and service. The division of the \$2000 income became a very interesting problem to them and each girl put herself in the place of the mother in such a home and tried to see what she would do under the circumstances.

The discussion of this problem like that of many others went from the classroom to the dinner table at home and then back again to the class-room. The fact that the parents have shared in these discussions has added both interest and value to the work. It has been noticeable, however, that the comments and suggestions made have usually come from the father, rather than the mother.

Through the continued interest of the home and the many messages that have gone back and forth between the school and home, the girls have gained a much broader outlook than would have been possible without this help.

A list of the reference books used follows:

The House, Bevier; *The Habitation of Man in All Ages*, Le Duc; *Prehistoric America*, Madaillac; *Prehistoric America*, Foster; *Woman's Share in Primitive Culture*, Mason; *Household Economics*, Campbell; *The Tree-Dwellers*, Dopp; *The Cave-Dwellers*, Dopp; *The Cliff-Dwellers*, Peet; *History of Architecture*, Fletcher; *Japan, Its Art, Architecture and Manufacture*; "Evolution of Domestic Life in America," *House Beautiful*, Vol. XII; *The Story of Architecture*, Mathews; *Colonial Days and Ways*, Smith; *Home Life in Colonial Days*, Earle; *Colonial Architecture of Maryland, Pennsylvania, and Virginia*, Chandler; *Colonial Days in Old New York*, Earle; *Practical Hygiene*, Currier; *House Sanitation*, Richards and Talbot; *Care of the House*, Clark; *How to Build a House*, Moore; *The Craftsman Magazine*; *The House Beautiful*; *Sanitation in the Modern Home*, Allen; *Principles of Home Decoration*, Wheeler; *Rugs—Oriental and Occidental*, Holt; *The Furnishing of a Modern Home*, Daniels; *Laundry Manual*; *Cost of Living*, Richards.

THE TEACHING OF HOUSEHOLD FURNISHING AND DECORATIONS.

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The study of household decoration has been recently introduced into the public schools of New York City, and is being emphasized in the course of domestic science. It is believed that the course has been very materially strengthened thereby. Both teachers and children have enjoyed the work as it has been presented. The children are quick to seize upon the underlying principles governing color, and their natural aptitude and taste for color selection guide them in adapting the schemes to the plan of fitting and furnishing a home.

In some schools there are rooms set apart for the purpose. Classes take the liveliest interest in selecting wall and floor coverings, furniture and hangings in good taste and in keeping with the general character of the room. Where this is not possible, small model rooms made by the teachers from wood and card-board are shown and the lessons drawn from these. General rules and principles governing artistic decoration are given in a short talk or concisely dictated; then the children are supplied with scraps of wall paper and different colored fabrics and make their own selection as to what is suitable for a living room, dining room, or bedroom, as the case may be, until a complete apartment or home has been planned for.

In one case, in a down town Italian district, the children made very successful wall paper designs for these three rooms. The children of another school in an uptown district carried off a prize offered by a high school for the best plan for fitting up and furnishing a model flat for use in the work of this high school. So it is hoped that the course may be a step toward vocational work, whereby these children may be trained for some wage earning profession.

¹ Read by Miss Agnes Daley before the Educational Section of the National Education Association, Boston, July 5-6, 1910.

The ruling principle of decoration is simplicity. Art is the relation of unity and variety, and the aim of the artist is to maintain simplicity by controlling variety with unity. The application of simplicity to color and form is the problem of decoration. These facts the teacher keeps in mind, and plans to bring them before the child in a simple attractive way with the idea of stimulating the interest as well.

A general plan for presenting a lesson and a few points emphasized is given as follows: Discussion: (1) Location of room—north, east, south, or west; (2) light or dark; (3) use to which the room is put; and (4) expenditure. Plan to furnish from the standpoint of—the artistic, economic, and hygienic.

Wall Covering.—If a sunny room, choose paper or covering of cool tones, such as blue, grey, green, and all their shades. If cold (north exposure) or dark, choose warm, rich tones, such as yellow, red, or orange with all their shades. If the ceiling be high the ideal to attain would be to break the lines in order to lower the effect. If the ceiling be low, choose a design to heighten the effect—an unobtrusive stripe, perhaps. Red and any of its shades are aggressive and bring the lines into prominence. Blue is a receding color. Large designs tend to make a room appear smaller. Half tone or plain papers of light color make it appear larger. Papers with designs are more economical because they do not show soiling as readily. Plain ground or half-toned papers are more artistic as they make a good back-ground for other fittings and are more restful to the eye.

Floor Coverings.—Advantages of rugs over carpets: (1) more cleanly; (2) may be less expensive; (3) there may be different floor stains and finishing to correspond to the wood-work and furniture. The ceiling and floor should be kept light if the idea of space is desired. There should be regard for the design of a rug that it may be consistent with rules governing good taste and common sense. For instance a rug bearing the design of a large and wonderful Newfoundland dog is not in good taste—dogs were never meant to walk on.

Note: Pictures of rugs cut from the catalogs of importing houses may be shown to illustrate the best colors and designs and their appropriateness.

Furniture.—Have the furniture in accordance with the use made of the room, and of simple but good design. Do not use carved furniture, unless a vacuum cleaner may be made use of. Advocate the advisability of buying always good plain furniture, rather than that of cheap, gaudy design and covering.

Note: Toy furniture may be purchased and its good and bad points discussed. In some cases cheap-looking toys may be changed into those of good substantial design, by cutting, sand papering and repairing.

Pictures.—Have prints or photographs of good pictures rather than cheap chromos or bad paintings. Select suitable subjects for pictures to be hung in the different rooms discussed. Have frames in keeping with the subject, and of unobtrusive design, etc.

Note: Perry and Cosmos pictures of fine paintings and statues may be purchased and shown.

General Rule.—Have only useful things in the home and make these ornamental. Non-essentials such as pictures, statues, and flower vases can be chosen with regard to subject, line, and purpose.

Note: Presenting the subject in this way obviates any sensitiveness which might come about from presenting the subject to children of varied classes, as must needs be in a large city. Adapt the lessons as far as possible to the needs of the children with whom you have to deal. Of course a general knowledge of color such as the teacher must possess from study is essential to the guidance of the children, and she must be able to assist in the decision as to whether a color scheme is to be analogous or complementary in composition.

The study of art has always been an elevating factor in the life of a nation, and it is strange that our people have not been quick to realize the practical value of its application. Anything and everything we can do to strengthen our home life—to give to it breadth, beauty and culture—will make for the betterment of our nation. Therefore, let us not neglect any detail that may serve to accomplish this end.

THE RELATION OF FINE ART TO DOMESTIC ART.¹

ELIZABETH STONE.

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In a general high school a course in art, if it is to be of practical service to the pupil after graduation, must try to do three things: (1) Train the eye to a keener and more accurate vision; (2) give the hand reasonable facility to express ideas, or record impressions; (3) develop discrimination ("good taste").

Of the three purposes, the last, in a public school, is most important, for where an average man or woman finds it necessary to make ten drawings in a life-time, he, or more particularly she, makes daily that number of decisions involving the principles of taste. A man chooses his neckties, the pictures for his office, the bill heads and the advertisements that he uses, while a woman's day is filled with opportunities to make her clothes and her home furnishings a pleasure or an irritation to those who view them.

The power to make successful decisions about restful lines and harmonious colors is not intuitive, nor does it come as a marriage portion. With men it is rare, because they are denied the training that a woman gets by unremitting practice; for this reason, among others, voters have not yet abolished bill boards. You have, however, only to observe your fellow passengers in a street car to discover women to whom good taste is like the Japanese emperor who never died because he never lived, while a series of calls in any neighborhood will reveal garish pictures and hybrid furniture. There is a tradition that if a man live to be a hundred he never forgets the table manners he learned as a boy; decisions in matters of taste might often be included in that tradition, and therefore discrimination should be inculcated young, lest we grow up with nonsensitive eyes, or worse still, with no standard except the vicious one of fashion. In the latter case we shall have a procession of half worn things creeping toward the attic, relics of the horse-hair,

¹ Read at the Boston Convention of the American Home Economics Association, January, 1910.

black, overcarved walnut, and the crushed plush periods, for it is only simple, useful orderly surroundings which, as the fittest, survive. If a school training can help to create a demand for reasonable and harmonious personal and civic belongings, it will have justified itself economically and æsthetically. To accomplish something toward this end a course in art cannot mean drawing a picture; it must be instead a definite training in the principles of order which govern alike the selection of a bureau or the planning of a public library. There must be a reasonable amount of practice according to these principles and a very strict connection between such practice and the work in manual training and domestic science.

It is with this conviction that the art course at the Brookline High School has been planned. Every pupil of each entering class is obliged to take the course for a year. Thirty problems are solved, ten in design, ten in representation, and ten in color. Both writing and drawing are a necessary part of the course. The writing, which comprises a statement of principles and simple criticisms involving their practical application, is done in a notebook illustrated by the pupil with sketches or with pictures he has collected. For instance, we decide that a curtain which is looped back at a window is less restful than one that hangs in straight folds because the first arrangement has no harmony with the lines of the window frame. Patterns for dress braiding and embroidery are discussed in the same way, and girls are surprised and pleased to find that they can make more orderly, and therefore more beautiful, patterns than many of those in the shops. The boys study order in pieces of furniture, fronts of houses and public buildings, and, for application, draw designs for door panellings, book rack ends, (later worked on out in the shop) and small metal accessories like drawer-pulls, hinges and escutcheons. The distinction between the proper uses of design and representation forms an important problem since the failure to grasp it is the root of many of sofa pillow and wall paper evils.

In representation we draw objects of common use, chairs, tables, kitchen utensils, and vases, for their powerful influence in making the pupil realize and observe the beauty that a line may have if it be clearly expressed and appropriate to its use.

The ten problems in color are planned, like those in design, to make the pupil familiar with some of the fundamental laws of color balance, color rhythm and color harmony, and then to afford him practice in accordance with them. Simple exercises in interior decoration are given, such as the planning of appropriate schemes for rooms of modern

proportions and various exposures. Study of the local decorator's windows, of furniture catalogues and paint manufacturers' literature accompanies this part of the course, and, wherever a comparison of prices is possible it is easy to drive home the important lesson that wisely selected, durable and orderly surroundings are also the cheapest.

Throughout the year the class examines articles in the current magazines, designs for embroidery and for wood-work, and simple house plans, a procedure that helps to counteract the notion all young people have, that anything attaining the dignity of type must be praiseworthy; it helps also to dampen their admiration for superficial drawing, for vacuous pink and white heroines whose hair or bonnet strings trail off into nothingness beneath their monotonous chins. Discrimination is further encouraged by a weekly exhibition on the bulletin board of good drawings in the newspapers, of thoughtful and witty cartoons, when we are fortunate enough to find that rarity in America, or of interesting art news, such as the opening of the New Museum in Boston. This year also there has been a series of lectures before the whole school on the selection of house furnishings; one on the subject in general, another on furniture, a third on the choice and disposition of pictures.

After the first year the courses in art are optional, and take up in more detail the general plan already outlined. In the third year a course in the history of architecture is offered, which, like the work in domestic science, first takes up the broad civic field and then the relation of the subject to the individual. The needlework department catalogues our designs for sofa pillows, centre pieces, scalloping, monograms and other embroidery so that when a pattern is needed recourse to the magazines or the shops is unnecessary. Moreover the pupil is not obliged to carry over knowledge from one subject to another; we plan to make the connection between. Thus we give some of our lessons in the domestic science laboratory, problems such as a menu card, or the scheme of table decoration for a particular meal.

The effort throughout is to make definite and practical a course that parents are prone to regard as vague and useless, to make the goal not technique or special ability in draughtmanship, but the increase in the child's power to see, to express, and to discriminate according to a few simple laws whose power is realized through examination and personal experiment.

PHYSIOLOGY AND COURSES IN HOME ECONOMICS.

PERCY G. STILES.

Simmons College.

The chief reason for giving instruction in physiology to students of Home Economics is found in the close relation between this science and hygiene—particularly the hygiene of nutrition. But the teacher of physiology must always feel reluctant to slight the educational side of his subject and its intrinsic interest. No science is better adapted to develop the power of inference, the habit of weighing evidence, or the rarer faculty of suspending judgment in default of data. None is more engrossing when historically treated; few are richer in the personalities of their leading exponents. Surely none have drawn so freely upon the other sciences for their experimental methods—a fact which makes physiological papers peculiarly varied and physiological technique notably ingenious.

Regarded as an applied science physiology is the foundation of hygiene and to an increasing extent of medicine. An elementary knowledge of physiology will do much to clarify one's judgment of popular teachings about health and disease, and to make possible some appreciation of the aims and achievements of modern medicine.

There are serious difficulties in the way of successful instruction in physiology. The most important is usually the lack of sufficient training in the supporting sciences. The physics and chemistry of the living body, a realm of the most complex relations, cannot be made clear to one who has not learned much of the physics and chemistry of the non-living world. A minor impediment to such instruction is met in the recoil of the immature student from a subject which he finds repulsive. This feeling is not often encountered when general biology or zoölogy has preceded physiology. The study of the lower animals will usually give an objective habit of thinking, so that when the discussion of the human system is begun the pupil will look out and not in, visualizing an impersonal anatomy instead of introspecting her own.

At Simmons College three courses in physiology are open to students of Home Economics. The most advanced of these is given in the Junior year and is common to the students of the school of science and

to such students of Home Economics as show a marked aptitude for biology. These pupils have had two full years of chemistry, one year of physics, and one year of biology, consisting of a general introductory course followed by one in anatomy and histology. They have had a good deal of dissection, microscopical work, and drawing. Their course in physiology is not intended to emphasize particular aspects of the animal economy but to be a symmetrical treatment of the subject nearly as extended as would be given in a medical school.

An alternative course is offered in the second semester of the Sophomore year. This is provided for the students who elect a minimum of biology, and it follows the introductory course mentioned above in place of the anatomy and histology. In contrast with the more advanced course, this one is frankly asymmetrical, the time devoted to nutrition being out of proportion to other divisions. Still it is designed to give a fair outline of all the main subjects with a full discussion of hygiene.

The most difficult problem which we face is the presentation of the essentials of physiology to the students who are not candidates for the degree and who are spending only a year or two at the college. It is necessary to give such pupils carefully chosen material, constantly bearing in mind their lack of preparation. They have had general chemistry but we cannot assume any other foundation upon which to build. The arrangement of this course will be discussed at some length.

No text book is used, the peculiar needs of this class not being met by any at present extant. A combination of Hough and Sedgwick's *Human Mechanism* with Fisher's *Physiology of Alimentation* could approximate to the requirement, but would fail to cover the subject of metabolism. Lectures, recitations, and laboratory exercises alternate. The conception of energy and its transformations is constantly prominent. In other words the body is viewed as a machine, complex indeed but not exempt from physical laws.

At the outset the cell is dwelt upon as the structural and the living unit. Cell-life is illustrated by infusoria and simple plants. When these are familiar it is easy to make plain the dependence of animals upon green plants and the immense importance of photosynthesis.

After this biological introduction the attention is directed more definitely to the human body. Its anatomy is briefly sketched with some reliance on a manikin. The properties of the chief tissues are broadly indicated. The distinction between the contractile, glandular, and nervous tissues on the one hand—those which are active in their metabolism and the connective and protective structures on the other

—those which are relatively stable, is emphasized. Sections of typical organs are studied and drawn. After the survey of anatomy it is easy to proceed to the subject of coördination, pointing out that there are two great factors in the unification of the body's working, the nervous and the chemical. The latter mode, the field of internal secretion, is just now coming to be estimated at something like its actual importance.

The central division of the course is now entered upon. The subject is of course the intake and output of the body, with the intervening transformations. The time devoted to this discussion is upwards of one-half the total. First comes a broad setting forth of the nature of foods, and a comparison between their proportionate relation in the usual diets and the percentage composition of the body.

The nature of the digestive changes and their purpose is taken up. It is necessary to combat the usual view that digestion is simply a means of making the food-stuffs diffusible. The processes involved have a deeper significance, the reduction of heterogeneous and foreign elements to simple units, or "building stones" in the forcible German expression, from which materials proper to the body can be formed. "Assimilation" is a key-word here; "naturalization" is a favorite one with the writer. The subject of the enzymes calls for careful treatment because of its unfamiliar nature. Secretion may be handled more briefly but stress needs to be laid on the nervous control of the glands. The story of digestion falls naturally into a series of sections, the saliva, the stomach, pancreatic digestion, the bile, the intestinal bacteria, the colon. The movements of the several divisions of the canal are described in connection with the chemical changes.

The facts in regard to absorption but not its abstruse theories may be given. The composition of the blood and the representation of the food-stuffs in it are then considered. The course of the circulation has been indicated in the early sketch of the anatomy and as the necessary condition of chemical coördination.

The service of the food-stuffs in the body is the next subject. Concerning carbohydrates we have to point out that the small but constant sugar content of the blood is secured through the formation of glycogen and of fat from the surplus of incoming sugars and the reconversion of glycogen to dextrose during fasting. The ultimate oxidation of dextrose with the release of energy as heat and work is discussed. The metabolism of fat is a simple subject for here we have only storage and oxidation to consider, the transformation of fat into sugar being unproved.

Protein metabolism is more difficult to explain to such a class. But

the students can understand that much of what we eat in the form of protein never regains that rank after the digestive cleavages, but merely serves the body as so much carbohydrate would do. One may hope to make the pupils see that when foreign proteins are devoted to the building of human tissues some waste will be inevitable. A fair illustration of the principle is found in the supposition that a house is torn down and another house of different architecture built from its timbers. There will be many unavailable pieces to discard. The discarded material may be turned to account as fuel either in the living body or in the supposed case of the new house.

The end products of metabolism and their elimination should be treated briefly, respiration finding its place in this connection. Then follows the statistical view of nutrition, quantity and proportion of the food-stuffs, the calories represented, the upper and lower limits of metabolism. The calculation of metabolism from the excreta may be explained and, above all, the proof with the calorimeter that the conservation of energy is a principle which the body does not transcend.

In conclusion, the brain and the sense organs may be allowed a few periods, but more as a basis for the discussion of general questions of hygiene than to give much detailed knowledge. Having secured such a basis we can bring together matter from all parts of our course to throw light on practical problems. Some of these are vital resistance and the factors concerned in it; the nature of fatigue; the causes of nutritional disturbance, connected with the diet and not so connected; alcohol (the much maltreated question); the power and the limitations of optimism to insure health; the physiological aspects of ventilation, etc.

We have found the laboratory work the hardest part of such a course to render profitable. Some drawing from slides (plankton, blood, starch, and histological preparations) has been prescribed. Enzyme action is best illustrated by salivary digestion and the clotting of milk by junket tablets. Varying the temperature, dilution, and other conditions may serve to extend these observations. Demonstrations of some other points are introduced. Among these are the irritability of muscle and nerve, the automaticity of the terrapin heart, inhibition (of the same), reflex action, and reaction time. It is the writer's tendency, after five year's contact with these classes, to subtract time from laboratory work and add it to the hours of quizzing and conference. For technical skill is certainly less the object sought than is a broad and general knowledge and an attitude toward the science that shall be *at once critical and receptive*.

CHEMISTRY FOR STUDENTS OF HOME ECONOMICS.

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In entering upon a discussion of the relation of chemistry to Home Economics, it would, evidently, be a waste of time to attempt to show that the correct appreciation of many of the subjects considered as a part of the science of the household, can be arrived at only through a knowledge of chemistry. I shall rather turn your attention to the problem which the teacher of chemistry has to meet in deciding upon the aim, the content, and the method of the course in chemistry which is best adapted to the needs of students of Home Economics. The problem is, I believe, a most important one and one which is far from solved. What I shall say applies only to college work, and has to do with the teaching of chemistry to college students who, on completion of their training, are either to teach Home Economics, or apply the science in some practical way.

The value of the course in chemistry to such students is twofold. A course, properly conducted, is an important factor in the mental development of the student, and it furnishes much information which may be applied more or less directly to her technical work. The most important question which the teacher must consider has to do with the relation between the amount of emphasis that is to be put on the educational and on the informational aspect of the course. The answer to this question determines the content and method of the course. It is my opinion that the educational value of chemistry has been largely overlooked in the endeavor to apply the science to the problems of the household, and to furnish the get-educated-quick student with a lot of so-called useful information.

I am thoroughly convinced that we, at least, who have to deal with college students, can find the time to conduct our work in such a way that the student gains, to some extent, some of the mental qualities which are so noticeably lacking in the majority of girls when they enter college. In the first year work we have to deal with a mass of happy enthusiasts who are willing to learn whatever we set before them.

But something more than enthusiasm is needed. For reasons more or less clear, the training which the student receives in the high school does not lead to that mental development which is a concomitant of education. The graduate comes to college with a record of having completed satisfactorily work in this and that subject. She has in the past been stuffed with certain facts, but most have been forgotten, and it is evident that little mental power has been developed in their transitory acquisition. She lacks the power of concentration, is innocent of logical thinking, and has no conception of how to attack a problem. She has the wrong point of view, placing too much reliance on authority. She has been trained to rely on her memory, and has not been shown how to reason.

It is an educational crime for us of the colleges to continue to feed her with facts unless they are well seasoned by logic. Each one of us must feel that we have a sacred duty to develop the minds of our students—to assist materially in their education. When they leave us they should be capable of more accurate reasoning, and should have developed to some extent the power to weigh cause and effect.

I believe that the aim of much of the teaching of chemistry to students of Home Economics has been purely informational. I do not believe, for example, that the practice of teaching the chemistry of foods to students, who have had some time in the past a course in chemistry in the high school, is a sound one, and yet this is done. The results are most distressing. Egregious blunders are made by the graduate, who has, perhaps, hydrolyzed starch, used Fehling's solution, and precipitated proteins, but is ignorant of the principles of chemistry.

Let me now outline the way in which we are attempting to solve the problem in the institution with which I am connected. I want to say at the outset that many details of the various courses in chemistry are changed each year—we are not sure of ourselves yet—but the general plan of the courses has been arrived at as the result of the careful watching of results for several years.

In the first year the students follow a rather thorough course in inorganic chemistry. Eight hours each week throughout the year are given to this work. There are two lectures, two recitations, and four hours of laboratory work. The sections are small and each student receives individual attention. The prime aim of the course is to develop power in the student. Many applications of chemistry to daily life are presented, and whenever possible the student is encouraged to observe and explain by what she has learned in class, the

chemical phenomena she meets. The recitations are an important part of the course. Here clearness of expression is insisted upon as an evidence of clear thinking. After a number of facts have been learned a question or problem is proposed, the solution of which requires the use of these facts. The endeavor is constantly made to make the student reason. Such training as this is, of course, valuable with all students, but it is particularly necessary in the case of girls.

Toward the end of the first year the student is given a number of simple compounds to identify. The work is not routine qualitative analysis, and few directions are given. The student is left more or less to her own devices in finding out what she has in hand. She has accumulated throughout the course most of the facts which are necessary in the identification of the substances given to the class. She must use her wits and common sense in bringing to bear her knowledge in the particular problem before her. Much of good comes from such work, although it is slow and the teacher is often discouraged.

All students of Household Economics who are candidates for degrees take the course in general inorganic chemistry. At the end of the year we find that some have developed materially under the treatment, and some have not. We have come to the parting of the ways. Those who have proved themselves capable of winning their way in science, and who show an interest in scientific things are encouraged to make the best of their capabilities in an extended study of chemistry. Those who have not shown such interest, but have satisfied the requirement in the chemistry of the first year, pursue work in decoration, design, sewing, and similar subjects. It is considered necessary, however, that these students should know more of chemistry than what they have gained in the course of the first year. They follow for half a year, eight hours per week, a course which is designed to give them such information in regard to organic chemistry and foods as is needed for an understanding of future work in physiology and dietaries. This course is largely informational. It includes much that is often given under the name of food chemistry, such as a study of such typical substances as eggs, milk, bread, meat, soap, etc. The work includes the testing for preservatives, and the qualitative examination of baking powders and other substances.

We have learned by experience that this minimum requirement of a year and a half in chemistry is best suited to the need of our students. But opportunity is offered for those who will profit by a broader view of the subject to devote a part of their time throughout the four years

to a thorough study of the science. Many students have availed themselves of this opportunity.

Those who elect at the end of the first year to emphasize chemistry in their course, follow in the first half of the second year a course in organic chemistry in which the principles of the science are discussed in some detail. Most of the time is devoted to a rather full consideration of the fatty compounds, as this part of organic chemistry is of particular importance to the student of the chemistry of foods. The subject is treated in sufficient detail so that the student will be able to understand the significance of the analytical methods of food analysis which she will meet later. For example, the chemistry of fats and carbohydrates is treated fully, and the student is carried far enough in the chemistry of the proteins to follow the work of Fischer on the polypeptids. The course is essentially pure organic chemistry, although the fact is kept in mind that the students have for their goal the study of foods in their chemical and physiological aspects.

In the second term these students spend seven hours per week learning the elements of quantitative analysis. We are of the opinion that familiarity with the methods of quantitative analysis is a necessary prerequisite of good work in food chemistry. The teacher of this subject who must spend a large share of his time in drilling his students in technique is much hampered. The student, therefore, spends two years preparing herself to take up the study of foods. During this time her mental faculties have been developed, she has gained much useful information, and has learned the use of her tools.

All the time devoted to chemistry in the third year— eight hours per week throughout the year— is given over to the study of foods. Here the standard methods of analysis are studied and attention is given to the quantitative analysis of water and of air. The work includes some qualitative experiments in elementary physiological chemistry. This side of the course is to be developed next year and we hope that the student may gain a more definite conception of the chemical problems involved in metabolism. The work in the course is largely done in the laboratory, but one hour per week is spent in conferences in the class room. Toward the end of the course a definite problem is assigned to each student for solution. These problems are simple, but the reading necessary and the planning of the laboratory work are helpful in developing resourcefulness.

The regular course in chemistry for students of Household Economics ends with the work in the chemistry of foods in the third year.

But a number of those who have completed the work which I have outlined have expressed a desire to continue the study of chemistry in the fourth year, and provision has been made for such students. Opportunity is here offered for the detailed study of some problem in the chemistry of foods. Certain students elect courses in chemistry which are in the regular program of the school of science. One course given in this school is planned to review and amplify the course in inorganic chemistry. Special emphasis is put on the problem of teaching inorganic chemistry to beginners. This course is taken by students of Household Economics who are preparing themselves to teach chemistry in addition to the subjects of their own profession. I believe such a course is of great value to the students and that they should be encouraged to continue the study of chemistry in the fourth year of their work. I also believe that work of a general character which broadens their outlook on chemistry is of infinitely more value than the detailed study of some particular subject which may appear to have a direct bearing on the chemistry of foods. A student who lacks a broad training in chemistry is wasting her time in spending hours on investigating the proteins of wheat, or the constituents of corn oil.

We hope to prepare in such a course teachers of Household Economics who are able to appreciate the bearing of chemistry on their work, who are able to solve the problems as they arise by scientific methods, who are able to keep up with the advances in science which have a bearing on their work, and who are able to teach better as the result of a broad scientific point of view. I do not mean that the teacher thus trained will dispense all her knowledge of science to an unfortunate class of beginners. The more one knows of a subject the more efficiently is that knowledge used. A full knowledge breeds caution. The more one knows the less one frequently teaches, the less the chance of teaching what is wrong. A teacher who has been well trained in chemistry will be able to apply the science in a sane manner in her instruction, and will make the student realize the importance of chemistry and the dignity of the technical subjects in Home Economics. There is, or should be, a demand for teachers of Home Economics, who are well trained in general science and who have what, for a better term, may be called a scientific point of view. I think the day of empirical knowledge is passing and that the colleges are beginning to graduate students who will put the instruction of Home Economics on a higher plane.

In conclusion, let me briefly summarize the opinions which I have

put forward. I believe that in the work in chemistry the mental development of the student is of paramount importance, that the principles of chemistry should be emphasized, and that the many chemical facts related to Household Economics should be taught only as illustrations or applications of these principles. I have also expressed the opinion that we should recognize that Home Economics may be divided into two distinct branches—the scientific and non-scientific—and that we should plan the work for our students with this fact in mind. I have outlined courses which have been adopted as meeting the requirements of those preparing themselves for activity in the two branches indicated. For those who expect to apply chemistry in their future work a thorough training in the science is insisted upon—a training which is received only as the result of the student's devoting an appreciable share of her time throughout three or four years to the study of chemistry. Some may say that I have unduly emphasized the place of chemistry, and that I have placed the standard too high. What's worth doing is worth doing well. If we profess to apply chemistry to Household Economics, let us see to it that we know our chemistry. It is well to aim high anyhow. The arrow will fall as it flies on its course and if we aim a little high we are more apt to hit the mark.

COURSES IN HOME ECONOMICS AS RELATED TO DEPARTMENT OF AGRICULTURE WORK.

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The prime object of a course in Home Economics is to train young women and girls to be home makers. The reason for this is that home-making is the chosen profession of the great majority of women, and competition in the commercial world is so great as to render it necessary that mothers bear the greater portion of the burden incident to the rearing of children and keeping the home, the father's time being largely consumed with business.

Since there are a few women who wish to enter professional lines, and many who desire to become more proficient in the domestic arts but do not feel that they have time and money for a regular college course, schools of domestic science usually also offer courses which will prepare women for some other vocation in addition to that of homemaking.

As commonly taught in schools, courses in Home Economics have, then, the following objects:

(1) Training women for home-makers; (2) training them for filling administrative positions in institutions where large numbers are housed and fed, and where competent supervisors are needed in providing supplies and preserving sanitary conditions, or for teaching domestic science in city schools, rural schools, and in other secondary schools for girls; (3) fitting them to be teachers in colleges or to be analysts in experiment stations, public health laboratories, etc.

As a preparation for any of these pursuits, the student must be put into possession of such knowledge as will be useful and readily available, not only at the present time, but through life. The perceptive powers must be trained to accuracy and alertness and the judgment and reasoning powers well developed. A person must understand the physical and human forces about him in order to be able to use them in advancing his own interests without infringing upon those of others, and if he hopes to succeed he must be able to do things that are worth while, and do them in a popular yet correct

and scientific manner. The same fundamental knowledge is necessary to all who would attain success in either domestic science or art. Hence, all courses in domestic science or Home Economics should include the same fundamental branches for training mind and hand.

Those who wish to become skilled laborers or business experts along this line take more of the general culture studies, and add much technical knowledge to the fund already acquired. Those who wish to become college professors or analysts must pursue, in addition to those studies taken by the other two classes, a large number of general culture and scientific subjects.

As an illustration of the work now offered along these several lines by a relatively high-grade institution, the courses now offered at the University of Minnesota are given below:

HOME ECONOMICS TRAINING OFFERED BY THE UNIVERSITY OF MINNESOTA.

AGRICULTURAL HIGH SCHOOL COURSE (SCHOOL OF AGRICULTURE).

FIRST YEAR

First term:

Agricultural botany.....	4 ¹
Drawing.....	2
Music.....	2
Farm mathematics.....	5
Cooking.....	4
Physical training.....	2
Sewing.....	4
Social culture.....	1
Field agriculture.....	3

Second term:

Agricultural botany.....	5
English.....	5
Music or literary society work	2
Comparative physiology.....	5
Study of breeds.....	5
Laundering.....	4
Drawing farm houses.....	4
Physical training.....	2
Farm accounts.....	4

SECOND YEAR.

First term:

English.....	2
Agricultural physics.....	5
Dairy chemistry.....	2
Dairy husbandry.....	5
Fruit growing.....	3
Music.....	2
Farm accounts.....	4
Cooking.....	4
Household art.....	1
Physical training.....	2
Sewing.....	4

Second term:

English.....	2
Agricultural chemistry.....	5
Dairy husbandry.....	5
Music.....	2
Agricultural physics.....	5
Vegetable gardening.....	3
Cooking.....	4
Home management.....	1
Physical training.....	2
Sewing.....	4

¹ Hours per week.

THIRD YEAR.

First term:

Agricultural chemistry.....	7
Forestry.....	3
Zoölogy.....	3
Poultry.....	3
Algebra.....	5
Cooking.....	4
Sewing.....	4
Music.....	2
Home nursing optional.....	

Second term:

Civics or English.....	4
Plant propagation.....	3
Entomology and insect collec- tion.....	3
Algebra ²	5
Meats.....	1
Home economy.....	1
Cooking.....	6
Domestic chemistry.....	3
Sewing.....	6
Domestic hygiene.....	1

NORMAL COURSE IN HOME ECONOMICS.

FIRST YEAR.

First semester:

Advanced rhetoric.....	3
Principles of teaching.....	3
Field agriculture.....	3
Agricultural chemistry.....	6
Agricultural botany.....	6
Entomology (first half).....	3
Elements of domestic science	4
Elementary sewing.....	4
The family.....	3
Domestic science.....	4
Position of woman.....	3
Physical training.....	2

Second semester:

Advanced rhetoric.....	3
Domestic chemistry.....	6
Vegetable gardening (first half)	3
Plant propagation (last half)	3
Poultry (last half).....	3
Meats.....	2
Elements of domestic science	4
Elementary sewing.....	4
Designs in drafting.....	4
Freehand drawing.....	4
General bacteriology.....	6
Domestic hygiene.....	3
Bread making.....	3
Physical training.....	2

SECOND YEAR.

First semester:

Domestic science practice teaching.....	4
The home.....	3
Methods in domestic science	4
Household art.....	4
Fruit growing.....	3
Chemistry of foods.....	6
Industrial education.....	3
Domestic art.....	3
Domestic service.....	3
General elective.....	3

Second semester:

Household sanitation.....	2
Methods of domestic science	4
Textiles.....	4
Domestic science practice teaching.....	4
Methods in domestic science.	4
Domestic chemistry.....	4
Floriculture.....	3
Nursing and dietetics.....	3
Drawing and designing.....	4
General elective.....	3

² Required of those intending to enter the College of Agriculture.

FULL COLLEGIATE COURSE IN HOME ECONOMICS.

FRESHMAN YEAR.

First semester:

Science, literature, French or German, economics.....	23
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Second semester:

Science, literature, French or German, economics (elective)	26
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SOPHOMORE YEAR.

First semester:

Science, literature, French or German.....	24
Domestic science.....	4
The home.....	3
Principles of teaching.....	3

Second semester;

Science, literature, French or German.....	24
Household sanitation.....	2
Bread making.....	2
General bacteriology.....	4

JUNIOR YEAR.

First semester:

Physiology and ecology.....	6
Position of woman.....	3
Advanced designing.....	6
Methods in domestic science	4
Industrial education.....	3
Quantitative chemistry.....	7
Chemistry of foods.....	3
Floriculture.....	3
General elective.....	3

Second semester:

Physiology and ecology.....	6
Domestic art.....	6
Domestic science practice teaching.....	4
Analysis of foods.....	6
Farm structures.....	3
Designing.....	4
Textiles.....	3
General elective.....	3

SENIOR YEAR.

First semester:

Domestic service.....	3
Household art.....	3
Domestic science practice teaching.....	4
Farm structures.....	3
Agricultural elective.....	3
General electives.....	6

Second semester:

Teachers course.....	3
Handicraft.....	3
Advanced domestic chemistry.	3
General electives.....	9

The Junior and Senior electives available include agriculture, agricultural engineering, animal nutrition, botany, dairy husbandry, domestic art, domestic science, drawing and designing, economics, education, entomology, geology, horticulture, psychology, political science and vegetable pathology.

The agricultural high school course prepares women for homemakers, and also gives sufficient knowledge for entering the normal and col-

lege courses. A certificate of graduation is given at the end of the third year. A fourth year in high school work in general academic studies is required of those who have not had general high school training.

Credits in Home Economics for the eight years covered by the high school and the full college work amount to 488 out of a total of 1200. The degree of B.S. is given at the end of the four years' collegiate course.

A few words will serve to make clear the fact that hand and mind are readily trained together and that such a union of physical and mental training enables a student more readily to interpret things in the world about her, and consequently to use and enjoy them much more thoroughly.

The work in the sciences as given in the first two courses does not attempt to cover all the principles of the subjects under discussion, but deals with matter from the housekeeper's standpoint. Both laboratory and lecture room experiments are largely those which have been developed in the class room, and seem to the writer to be of a much more practical nature than those usually found in text books.

The application of many of the principles brought out in the study of physiology and hygiene may be readily demonstrated by the teacher in sewing. Thus, sewing as a fundamental study in a course in domestic science not only gives to a student the elements necessary to needlework in the home, and puts her in possession of such knowledge as will enable her to fashion garments, use colors properly, and select fabrics economically and wisely, but also teaches her that the object of clothing is not merely to adorn the wearer, but that it should first serve hygienic purposes, and afterward be planned to suit individual taste and conform to the requirements of fashion.

Fashion, she learns, should be followed only in such particulars as will cause no infringement on the laws of nature. To serve its legitimate purpose, clothing must permit a circulation of air, skin breathing and free evaporation. It should not only not impede these processes, but should aid in the performance of such normal body functions. When mind and spirit are trained at the same time, students realize that an observance of nature's laws does not prohibit the use of dress as a means of enhancing beauty, but that by the use of right materials and colors, severe outlines can be softened and ugly forms rendered more pleasing. Outward costume may be

very elaborate, but must be considered entirely apart from necessary clothing if it interferes by tightness, weight or imperviousness of material with the function of true clothing.

The students are helped to realize that although men are free-will agents the laws of hygiene cannot be disregarded; on the other hand, they must never lose sight of the fact that the observance of hygienic laws means good health in the ordinary course of events, and that their nonobservance means poor health, that nature's laws are inexorable and that when they are broken, a penalty is unavoidable.

The principles of light and color as taught in physics are so applied that students may have a clearer knowledge of the proper lighting of school or dwelling houses and may be able better to understand the principles underlying combinations of colors and to apply them in matters of dress, housefurnishing and decorating.

In this fundamental course only so much on the subject of textiles is taught as will enable a woman to become sufficiently well acquainted with the economic and esthetic value of the four commonly used materials, cotton, wool, linen, and silk, so that when later she is face to face with such problems she may be able, by observing, thinking and studying, to clothe her family and furnish her house economically tastefully and well. One who wishes to become a business woman, or a teacher in the textile branch of Home Economics, must delve deeper into the subject of textiles, must study the history of dyeing, spinning and weaving, and the methods by which different fibers are combined in making cloth, etc. She must learn to express art more fully in color schemes for rooms, clothing and furniture. In short, she must get a fuller meaning of art and architecture in their application to a beautiful and comfortable home.

Man early learned that shelter of some kind is necessary as a protection from inclement weather and from the extremes of heat and cold, but the idea of uniting beauty and utility in house-building did not come until later when civilization was much more advanced. At the present time women who study domestic science realize that a house owned has many advantages over one which is rented, and that either is preferable to keeping house in mere rooms, or to boarding—even though this be under the most favorable circumstances, as in an apartment house or a family hotel.

A detached house gives not only unity and privacy to a family, but the sense of ownership which it may also afford aids in building character in children, for such active and busy creatures are impressed

by their environment and learn much from it. The grass, shrubs, and flowers which a house and lawn or even a house and back yard render possible, give children an idea of nature which they cannot gain from an acquaintance with cut-flowers and greenhouse collections. With such a larger or smaller piece of ground there is often the opportunity to keep domestic animals for pets or profit, and children who have animal pets learn not only to love and respect them, but also acquire a view of domestic animals in their relation to man which is different from that common to children who know only the horse and the dog as seen on the street, and the sheep and cow as their dressed carcasses are displayed in the market, ready to serve as food for man. To children of cities or towns who cannot see the birds, flowers and beasts in their native groves and fields, an educated mother who will properly supervise their reading and will direct their attention in parks, zoölogical gardens, etc. is a blessing.

A course in domestic science aims also to apply general culture studies in a concrete way. For example, mechanical drawing deals with plans for dwelling houses and the subject of home management, which follows it, treats of the proper care of the house as well as with all things in and about it. Thus the ideas gained in architectural drawing find practical application, the impressions given become lasting, and the knowledge is available at any time during life.

It is sometimes said that if the work in kitchens were done by men that part of the house would be reconstructed. We have but to compare some kitchens with the workshops and laboratories of men to be convinced that too little thought is given to planning this, "the heart of the house," the part in which the food necessary to the life and health of the family is prepared.

No woman who is properly trained in domestic science fails to devote thought and energy to home conditions. She may not be able to reconstruct her house, because after a house is built changes are expensive and troublesome, but if such a woman can plan a new house for a home, she will arrange it so that she and all those who assist in the care of it will walk many miles less in doing the kitchen work than do some women. She will see that the kitchen sink, laundry tubs, gaslight, and hooks in the closet are put up with some relation to the height of the occupants of the house, and not of uniform height, as is the general custom. She readily knows that a few inches difference in the height of sinks, tubs, and range makes a difference in the physical and mental attitude of a woman doing housework, because

under proper conditions less energy is required, the muscles are less rigid and the mind more free while performing duties which require that the body be kept for some time in one position.

A glance at proposed outlines of lessons on food will show that although food and nutrition are the special objects of study, sufficient time must be devoted to the subjects of physics, botany, and chemistry to give students a good knowledge of the principles underlying these subjects. The application of general principles to special courses in the teaching of domestic science aids much in securing for it the place which it deserves in the popular estimation of a woman's education.

Applied science can so readily be made to follow pure science and problems bearing on household affairs are so easily arranged that students in all the courses not only enjoy the pure science more because they know that it is soon to be applied in kitchen and laundry, but they have a keener interest in the results of experiments, and a better memory for illustrations used.

In physics, for instance, the principles of solution are so taught that a girl knows why she uses gasoline or benzine, etc., for removing grease from wearing apparel, or kerosene to clean the bearings of her sewing machine. The principles of evaporation and of the diffusion of gases are taught, so that she may know why gasoline is more dangerous at ordinary temperature than kerosene, and why a full lamp or a full can of kerosene could not explode, while one only partly filled might do so, especially after standing in the sunlight or in a warm place.

From the study of capillarity she learns why a lamp-wick should be discarded before it has gotten so short that it will not reach the kerosene, and why it is desirable to keep open the small air-channels at the side of the wick.

From her study of air currents and of heat she learns why her stove smokes on some days and not on others, especially if the top of the chimney is lower than the highest part of the roof; and how the chimney extending to the bottom of the cellar, with an adjustable opening there, may be used to warm the cellar in winter and to freshen the air at any time. She learns why, in general, provisions for a foul-air shaft or vent are important in her home and in the school building.

A knowledge of the fundamental laws of heating and ventilating is of great value to the teacher, and also to the home-maker, because a

child who breathes pure air and is always comfortable is best prepared to receive and retain such knowledge and training as are the ground-work of good citizenship.

In domestic science courses, cookery is put on a scientific basis and thus enlists the powers of many of the best young women who enter the college courses. Attention is given to such subjects as dietary studies of families, cost and value of foods, losses in the cooking and preparation of foods, cereal food products, animal food products, adulterations of foods and their detection; fuels, soaps, dye stuffs and colors, composition of common household utensils, the household water supply, preparation of home-made baking powder, baker's chemicals, composition, food value and characteristics of tea, coffee, chocolate, cocoa, molasses, honey, vinegar and spices, the grading and testing of wheat flour, and the chemistry of bread-making.

The threads of connection between chemistry, physics, etc., and those studies pertaining to domestic science are so knit and woven together as to bring all the studies into one coherent body of interesting facts. Even arithmetic as applied in cooking and sewing ceases to be a dry study, because it is always used in the concrete, and the accuracy necessary in domestic science helps in forming good habits in other classes.

The study of accounts, when applied in domestic science, becomes the handmaid of home economy. Women in general have little idea of business methods, and the knowledge gained in this simple system of bookkeeping helps to strengthen the judgment and render the observation keener and quicker, as well as to form a basis for a system of household accounts which aims to train girls in the right use of money.

In this a study is made of just proportions between expenditure and income, also of a definite proportion to be expended for existence, comfort, and philanthropy. A study of the sources of income and of the purchase of household stores and furnishings, as well as clothing, is considered from the standpoint of the suitable.

The relation of cash and credit to cost is considered, and attention is given to savings and forms of investment, to bank accounts and to the use of a check-book. At the end of the allotted time students are required to submit an account setting forth in detail the use of a certain named income expended for the support of a family for one year, embracing not only every item of necessary home expense, but also an outlay made for travel, luxuries, accident, sickness or other

emergencies. When hand and mind are thus trained together along the entire line of home duties these rise in dignity, and housework ceases to be looked upon as a drudgery. Women thus educated have a sound notion of values in both money and occupation. They realize that the mind is as necessary a tool to successful women as it is to the shrewd business man, and that it must be as constantly used if they will keep their interests active, their tastes perfect, and their impulses effective.

The subject of nutrition is one which must of necessity occupy a large place in any perfect course in domestic science. It is also one in which there are few satisfactory text-books in the English language. Teachers depend for their data largely on special text and reference books, and on the publications of the United States Department of Agriculture, particularly those which have been issued by the Office of Experiment Stations in connection with its nutrition investigations.

THE AMOUNT OF EDIBLE MEAT IN THE VARIOUS CUTS FROM ANIMALS OF KNOWN LIFE HISTORIES.¹

FLORA HARTLEY GREENE.

The scientific cooking of meat in America is still in its infancy. The methods used have been the ones handed down from the grandmothers, or those devised by unskilled cooks, neither one of which is likely to lead to great advancement.

In its higher development the cooking has followed the English method of developing the flavor inherent in the meat, and this method has been more or less successful because our supply comes from an abundance of well-fed, well-matured animals.

The most extended scientific work on the cooking of meats has been carried on at the University of Illinois. At that institution Prof. H. S. Grindley, with a corps of able assistants, has been working since 1904 on some of the problems of cooking meat. He has done much valuable work and obtained some unexpected results, and we may hope for much more in the future from his laboratory.

The work of Professor Grindley indicates that the digestibility of meat is not dependent upon the cut of meat.² He finds that a cut of meat from the shoulder digests about as readily and completely as one from the loin, the differences in digestibility being too small to be considered. He also finds that the method of cooking has little effect on the nutritive value of the meat. He says, "In general the various methods of cooking materially modify the appearance, texture, and flavor of the meat, and hence its palatability, but have little effect on the total nutritive value."³

If this be true, then one may choose a cut of meat from any place in the animal he wishes and cook it as he pleases, and yet in the end have meat that is equally nutritive and digestible if its composition is the same to begin with.

¹ A thesis presented to the College of Agriculture of the University of Missouri, June, 1909, in partial fulfillment of the requirements for the degree of master of science.

² U. S. Dept. Agr., Office of Experiment Stations, Bull. 193, p. 100.

³ U. S. Dept. Agr., Office of Experiment Stations, Bull. 162, p. 230.

STATEMENT OF THE PROBLEM.

My series of experiments was undertaken with the thought of studying the composition of the different cuts of meat from the house-keeper's standpoint, to determine *what cuts will furnish the most edible meat for a given amount of money.*

These experiments are based entirely upon results obtained by accurate weighings. The cooked meat has not been chemically analyzed and hence the nutritive value of the meat is not here discussed. So far as I have been able to learn from the literature, no one else has attempted this problem.

The opportunity presented was an unusual one for, through the courtesy of the Experiment Station of the University of Missouri, it was made possible for me to secure exactly similar cuts from a series of animals which were being studied in nutrition experiments of the station.

APPARATUS.

The apparatus used in these experiments is all simple and was selected on the basis of adaptability to the purpose.

The oven.—The oven was an ordinary gas range oven, heated by two cylinder burners placed beneath. A wire frame or oven grate was placed on the lowest support in the oven. This raised the bottom of the roasting pan one inch from the bottom of the oven and allowed complete circulation of heated air around the roast. The temperature of the oven was determined by a centigrade thermometer which was inserted into the oven through a small hole in the center of one side of the oven. This brought the bulb of the thermometer to the top and side of the roast. It could be read without opening the oven door.

The Roasting Pan.—The pan used for all the roasts was made of granite iron. It was oval in shape, with a concave bottom, and was 18 by 15 by 3½ in. in dimensions. No cover was used in any of the experiments in roasting, and no water was used with any of the roasts.

The Support.—Several different supports were used in an effort to find one that would hold any roast high enough from the bottom of the pan to escape all drippings, and be easily cleaned of all fat and extractives. The one most used was made from a sheet of brass 12 by 6 in. The four corners were turned sharply down one inch, and the whole of it polished very smooth. Such a piece in porcelain would be much better.

The Braising Kettle.—An old fashioned six quart brass kettle was used for the braising. It was found very satisfactory because it could be heated very hot in searing the roast at the beginning of the experiment, and its thick walls made it easy to keep a constant temperature. A close-fitting tin lid with a hole for the insertion of the thermometer covered it.

The Boiling Kettle.—The boiling kettle was one of ordinary granite iron with a fitted lid. The lid was perforated for the thermometer.

The Thermometers.—The thermometers used were ordinary glass rod Centigrades. The one used for internal meat temperature was calibrated to read 100°. This gave wide spaces and brought the point to be read above the surface of the thick roasts.

The Balance.—The balance used was an ordinary spring torsion and the weights were of brass and read to one gram.

THE CUTS OF MEAT USED.

(1) *Beef Loaf.*—The beef loaves were of two kinds, ground meat from the neck and chuck, and ground meat from the flank and plate.

(2) *Boiling Pieces.*—These pieces were the plate pieces that are cut from the ends of rib roasts and consequently varied with the rib roasts.

(3) *Round Roast or Braise.*—This roast was made from the entire large muscle on the outside of the upper end of the round cut. It is what is usually spoken of as the tough side, and was cut about three inches thick.

(4) *Rib Roast.*—The rib roasts used were cut the standing length and included the sixth and seventh ribs and the eleventh and twelfth ribs, counting from the head backward. The cuts were made exactly between the adjoining ribs. Each roast was completely boned, rolled, and tied ready for roasting by the butcher.

(5) *Porter House Steaks.*—These were cut thick and were the cut just forward of the porter house roast.

(6) *Porter House Roast.*—These roasts included the last two vertebrae of porter house cut and were cut short and not boned.

METHODS OF COOKING.

Beef Loaf.—The meat was ground quite fine and then thoroughly mixed with weighed amounts of different condiments and materials

for retaining within the loaf its juice and fat. Egg, cracker crumbs, salt, pepper, sage and cloves were used in the different loaves. An effort was made to retain all the juice of the meat and just as much fat as possible and still make the loaf the most palatable. After mixing, the loaf was rubbed smooth over the outside and placed on the support in the roasting pan. The meat was placed in the oven when it registered 250° C. The oven was held at that temperature for fifteen minutes, when the fire was turned off and the oven cooled slowly till it reached 175°. The fire was then re-lighted and the oven kept at 175° until the internal temperature of the loaf was 65°. The loaf was then weighed and served. The fat dripping was weighed; the pan and support carefully washed to remove all extractives, the wash water then being analyzed to determine the nitrogen content. The weight of added condiments and crackers was deducted from the weight of the cooked loaf, and the result was called edible meat. The dripping was called waste fat. The material left in the pan other than fat dripping was called extractives.

No water was used in roasting any of the meats and no cover was used on the roasting pan.

Boiling Pieces or Stews.—The boiling pieces used in these experiments were from the navel end of the plate, and two methods were used in their preparation. The meat was cut into pieces of a suitable size for stewing, and excessive fat was removed and considered as waste fat. The meat was placed in a granite iron kettle with a closely fitting lid. A small but measured amount of boiling water was added and a thermometer inserted. The amount of water varied with the amount of meat and the size of the kettle, but the effort was to use just as little water as possible. After adding the water the meat was kept over the hot flame until the whole mass was just boiling, which was in from three to five minutes. The kettle was then placed over the "simmerer" and kept at 85° C. until the meat was tender. This required from six to ten hours. The meat was then thoroughly drained, and the bone removed and weighed. The excess fat was cut away and all the waste or inedible material removed and weighed. In one method, the edible meat was weighed and served as boiled meat, meat pie, various stews, and as hash or croquettes. The liquid in the kettle was chilled, and the fat removed. The remaining liquid was analyzed for nitrogen content.

Others of these boiling pieces were cooked until they were very tender and could be easily pulled into bits. The excess fat and wastes

of all kinds were removed and the edible meat was shredded. Condiments of various kinds were added and the liquor remaining in the kettle was poured over it and the whole placed to harden under pressure. The result was a very tasty bit of cold meat, with a larger percentage of fat embodied in it than in the boiling pieces cooked by the preceding method.

Braised Round.—A small bit of fat was cut from the round and tried out in a brass kettle. If the round did not have enough fat for this purpose, 20 gms. of fresh lard was added. The round was placed in the kettle and turned over and around until it was well seared all over. A small support was then placed in the bottom of the kettle to allow circulation of water underneath the meat. A weighed amount of boiling water was then added, as small in amount as possible, to keep the meat from burning. The kettle was then placed over the "simmerer" and kept at 85° C. until the meat was tender.

For braised meat to be best it should be cooked in this manner, but also have vegetables or wine and spices added to the water. These were all omitted in these experiments because they would have made the determination of actual weight of edible meat more complicated.

This method of cooking meat has been in use for hundreds of years. The earlier and perhaps better method was to have a cup-shaped lid for the pot. Into this lid hot coals were placed, so that the top of the meat was browned while the lower part was kept in water.

Rolled Rib Roast.—The rolled rib roasts were placed on a support that held it above all possible drippings in the bottom of the pan, and so that the part of the outside having the most fat should be at the top. This insured a continuous basting of the roast with its own fat and without any further thought from the experimenter.

The roast was placed in the oven when the temperature was 250° C. It was there held for 15 to 20 minutes, depending upon the size of the roast. The heat was then turned off and the oven cooled gradually to 175°. The fire was then lighted again and the temperature was held at 175° until the internal temperature of the roast was 65°. This temperature was determined by thrusting a thermometer down through the top of the roast to its center in the thickest portion. When the internal temperature had reached the desired degree the roast was removed from the oven, and the pan, support, meat, drippings and all were weighed. The roast was then removed from the pan and placed on a platter for serving. The drippings in the pan were weighed and recorded as waste fat. The pan and support were

washed with measured amounts of hot water and this water was analyzed for nitrogen content. The roast was cut into suitable pieces for serving, all excess fat weighed as waste fat, and the meat then served. All bits of fat or connective tissue left on the plate were collected, assorted and weighed as waste fat, or miscellaneous waste. The weight of all this waste fat, miscellaneous waste, strings, skewers, etc., was deducted from the weight of the meat just from the oven in order to obtain the amount of edible meat.

No water was used in this roasting and the meat was not basted.

Porter House Roast—The porter house roast and the standing rib roasts were cooked in exactly the same way as the rolled rib roast, except that the bone was not removed. The roasts were placed on the support in the roasting pan with the fat or skin side on top. In a very thin animal the leaf fat was removed from the inside of the cut and placed on top of the roast and fastened there with wooden skewers. This insured the necessary basting with its own fat.

The roast was weighed, carved and reweighed in exactly the same manner as the rib roasts.

Porter House Steak.—These steaks were placed on an ordinary grill which was heated from above. When the broiling oven was 280° C. the grill was run under the flame and quite close to it. It was allowed to remain here until the meat was well seared, then the steak was reversed and seared on the other side. This was continued until the internal temperature of the steak registered 60° C. The steaks were weighed and served just as were the roasts. The fat remaining in the dripping pan was weighed as waste fat, though its weight is not considered of great accuracy, as the amount of fat burned during the broiling unavoidably varied considerably.

HISTORY OF THE ANIMALS USED.

Meat from five animals was used in the tests. No. 504 was a high grade Hereford steer, twenty months old when slaughtered. No. 48 was a Shorthorn grade steer about four and a-half years old. A butcher would class him as "choice but rather too fat for anything but the choicest city market." No. 63 was a full-blooded Jersey cow, six years old. She had been fed a maintenance milch cow's ration all the time, but had been without milk for three months before slaughtering. She would be classed in the trade as a "poor cutter."

The fourth animal was a high grade Hereford steer designated "J,"

fed for the show ring. His diet was constantly changed so as to tempt him and make him eat as much as possible. He was given all kinds of food from brown sugar and breakfast food to oats and corn. Every effort was made to make and keep him just as large as possible, yet not make him rough. He would be classified in the market as an "extra choice," but he was too fat for the ordinary trade.

A pure blood Galloway steer designated "B," fed for the show ring, was also used. When slaughtered he was about three years old. His ration was a varied one, planned to make him eat as much as possible. He would sell in the market as "choice."

RESULTS OF COOKING TESTS.

The average results from the entire series of experiments are presented in tabular form below:

TABLE I.

Average percentage of edible meat, wastes in cooking, and cost per pound of different cuts from all the animals used.

KIND OF MEAT.	FAT WASTE.	BONE WASTE.	WATER LOSS.	EDIBLE MEAT.	COST OF EDIBLE MEAT PER POUND.
	<i>Per Cent.</i>	<i>Per Cent.</i>	<i>Per Cent.</i>	<i>Per Cent.</i>	<i>Cents.</i>
Beef loaf.....	11.8	—	13.2	72.9	20.6
Braised round.....	—	—	14.4	61.4	24.4
Boiled rib.....	38.2	9.1	—	36.5	27.5
Rib roast.....	24.4	20.5	10.2	41.6	37.5
Porter house roast.....	34.0	15.7	7.8	41.2	61.1
Porter house steak.....	24.8	13.9	13.	42.2	63.3
Average per unit weight.....	....	....	....	50.0	39.0

PRICES OF MEAT.

The prices used as a basis for computation in this paper are the prices that obtained in the local retail markets in Columbia, Mo., during the month of March, 1909, as follows: round steak 15 cts. per pound; porter-house steak, 25 cts.; porter-house roast, cut short, 25 cts.; standing rib roast, 15 cts.; rolled rib roast, 15 cts.; plate, navel end, 10 cts.; and beef loaf, 15 cts.

The price per pound of waste fat as here used is 6 cts. This is not the market value, but it is believed to be worth this amount to the housewife who uses waste fat in different ways in cooking and for soap making. To obtain the item called "value of edible meat," the value of the waste fat from any pound of meat as purchased from the butcher is allowed for in deducing the cost price of every pound of edible meat.

DISCUSSION OF DATA.

From the above table it will be seen that the grand total per unit of weight of all the animals is 50 per cent of edible meat valued at 39 cts. per pound.

The highest percentage of edible meat, 72.9, is found in the beef loaf. Here the loss in fat is 11.8 per cent and the loss in evaporation in cooking 13.2 per cent. The cost per pound of edible meat becomes 20.6 cts. or 5.6 cts. per pound more than the price paid the butcher.

The braised round meat gives 61.4 per cent of edible meat, with a water loss of 14.4 per cent. There was no loss in fat, as it was all incorporated in the sauce made from the broth. The cost of the edible meat was 24.4 cts. per pound which is an increase of 9.4 cts. per pound over the butcher's price.

The boiled rib ends averaged 36.5 per cent of edible meat, 38.2 per cent of waste fat, and 20.5 per cent of bone. This makes the price 27.5 cts. for a pound of edible meat that cost only 10 cts. at the shop.

The five rib roasts averaged 41.6 per cent of edible meat, 24.4 per cent of fat, 20.5 per cent of bone, and 10.2 per cent loss in water. The butcher's price of 15 cts. per pound is increased to 37.5 cts. for a pound of edible meat.

The porter house roast contained 41.2 per cent of edible meat, 34 per cent of waste fat, and 15.7 per cent of bone, and lost 7.8 per cent of water in cooking. As compared with the rib roasts, the edible meat is approximately the same. The rib roasts lose much in bone and the porter house loses excessively in waste fat.

The cost of the porter house is increased from 25 cts. for the butcher's pound to 61.1 cts. for a pound of edible meat.

The value of the porter house steaks correspond to that of the porter house roasts very closely. They lost more in water evaporation, which may have been due to the fact that the broiler was so arranged that the fat which was tried out did not baste the sides, thus leaving two large lean surfaces exposed for evaporation. They

lost less in waste fat, which may have been due to the fact that the broiled fat is more palatable, hence more of it eaten than in the roast.

COMPARATIVE LOSSES IN DIFFERENT TYPES OF ANIMALS.

With a view to comparing the losses in cooking and relative value of the different cuts in diverse types of animals, Tables 2 and 3 are presented below:

TABLE II.

Percentage of edible meat, waste fat, bone and water, and cost per pound of all cuts in animal No. 63, presented as a type of the poorer grade of beef.

KIND OF MEAT.	BUTCH- ER'S WEIGHT.	WASTE FAT.	WASTE BONE.	WATER LOSS.	EDIBLE MEAT.	COST OF EDIBLE MEAT PER POUND.
	Gms.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Cents.
Beef loaf.....	1185	0.4	—	16.8	82.7	18.0
Braised round.....	1070	—	—	16.0	59.3	25.3
Boiled rib.....	1454	2.8	22.5	17.7	57.9	17.3
Rib roast.....	4385	13.0	39.7	7.5	38.1	39.0
Porter house roast.....	1475	14.9	16.6	9.5	51.6	48.0
Porter house steak.....	465	—	21.5	12.3	53.8	46.2
Average per unit weight.....	....	....	....	....	57.2	30.6

TABLE III.

Percentage of edible meat, waste fat, bone, and water, and cost per pound of all the cuts from the high-grade Hereford steer "J," a type of the best or extra choice beef.

KIND OF MEAT.	BUTCH- ER'S WEIGHT.	WASTE FAT.	WASTE BONE.	WATER LOSS.	EDIBLE MEAT.	COST OF EDIBLE MEAT PER LB.
	Gms.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Cents.
Beef loaf ^a	1000	6.5	—	13.0	75.2	19.9
Braised round.....	2110	—	—	6.2	65.8	22.8
Boiled rib.....	3779	53.0	6.2	—	29.2	34.2
Rib roast.....	9161	41.2	11.7	9.9	32.3	46.0
Porter house roast.....	4862	50.9	7.3	6.4	35.6	70.0
Porter house steak.....	1845	50.0	4.8	7.9	36.6	68.3
Average per unit weight.....	....	....	....	....	45.8	43.7

^a Made from rib lean from which all gross fat had been removed.

Tables 2 and 3 represent the two extreme animals in the series of experiments. Table 2 gives the value in percentage of the different cuts of the cow No. 63, the edible meat, waste fat, bone, and water, and the cost per pound of the edible meat. It is interesting to note that the highest percentage of edible meat of all the cuts is found in the beef loaf of this animal (82.7 per cent), and it has the low actual value of 18 cts. per pound. The braised round furnishes 59.3 per cent of edible meat at 25.3 cents per pound. Boiled rib gives 57.9 per cent of edible meat and costs 17.3 cts. per pound. The rib roast gives only 38.1 per cent of edible meat. This small amount of edible meat in the rib roast is caused by the large percentage of bone waste, *i.e.*, 39.7 per cent. The amount lost by evaporation is very small. This is probably due to the fact that the meat was so rolled as to make the skin fat completely surround the roast. It was then so placed in the pan that the fattest part was above and the fat in trying out basted the exposed sides and prevented evaporation.

The porter house roast lost little by evaporation. As previously explained, the kidney fat of this roast was fastened on top of the roast. The percentage of edible meat is higher than in the rib roast, and the weight of bone much less. This is an interesting point because in all the cuts, except those from the loin, the cow No. 63 has a proportionately larger percentage of bone. This may possibly be due to skeletal differences based on breed or sex. The average per unit of weight of edible meat in No. 63 is 57.2 per cent, with an average value of 30.6 cts. per pound of edible meat.

Table 3 gives the percentages for the high grade Hereford steer "J." The beef loaf gives 75.2 per cent of edible meat, but this cannot be fairly compared with other animals since this loaf was made from a rib cut from which all visible fat had been removed. It does show that there was a higher percentage of fat included in the muscle alone of the steer than was present in all the fat of the neck and chuck of No. 63.

The steer gave a higher percentage of edible meat in the braised round (65.8 per cent) than did No. 63 (59.3 per cent). This may be due either to the presence of more fat in the flesh of this steer or to less loss in moisture.

All the remaining cuts from this steer lost very heavily in waste fat, the least loss being in rib roast (41.2 per cent), and the greatest being in porter house roast (50.9 per cent).

The average price per unit of weight of the meat from this steer is 43.7 cts. per pound of edible meat, which forms 45.8 per cent of each pound. This was 13.1 cts. per pound more than the corresponding value for the cow, and 4.7 cts. more than the average for all the animals.

This series of experiments is closed with the feeling that there is yet much more to be done on this problem. Many interesting and suggestive side lines of work have been observed during the study. It is hoped that they may be investigated in the future, and that the present problem may be further extended.

SUMMARY AND CONCLUSIONS.

The conclusions here recorded are based on a study of forty-one cuts taken from five different animals.

(1) The highest percentage of edible meat was obtained from the beef loaf. Loaf made from neck and chuck was a cent or two cheaper than that made from plate and flank.

(2) The amount of waste fat was small in the beef loaf, because a large amount of it was held in the loaf by the added ingredients, making the fat become edible meat. This made the total cost per pound of edible meat lower than in any other cut, even at the same price for the butcher's weight.

(3) Braised round is an inexpensive meat with practically no loss except that of evaporation. It costs only a few cents more per pound than beef loaf.

(4) Boiled rib end is usually an expensive meat because a large percentage is lost in wasteful fat. The finished product is not so desirable, from the housekeeper's standpoint, as that of other cuts. All of its possibilities are found in the round and at less expenditure of money and time.

(5) Rib roast gives a fair share of fine meat at an average price. The indications are that the amount of loss in waste fat increases as the cut approaches the loin. The chuck rib roast will possibly yield the highest percentage of edible meat, but the quality of the meat may not be so good. The best rib roasts as to juiciness were those made from the eleventh and twelfth ribs.

(6) Porter house, either as roast or as steak, is a most expensive meat, largely because of its usual excessive loss in waste fat.

(7) The loss by evaporation is greatest in lean meats and least in excessively fat meats. It is also greater in small cuts than in large ones.

(8) Long cooking increases the loss in evaporation of water and in the loss of fat.

(9) The fatter the animal the lower the percentage of loss in bone. An apparent exception to this rule exists in the loin cuts from the lean cow, No. 63, when compared with the fat steers. This is probably due to skeletal differences based on sex or breed.

(10) Bone loses weight in cooking. The percentage of bone in the standing rib roasts, roasted with the bone left in, is not so high as that originally in the rolled rib roasts which were boned before roasting. It was not determined whether this is due to water loss only, or whether other substances also are lost to the meat from the bone in cooking.

(11) The juiciness of the roast seems to be directly proportioned to the amount of fat it contains.

(12) The fat roasts of this series are of higher flavor than the lean roasts.

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GRADUATE SCHOOL OF HOME ECONOMICS.

The third Graduate School of Home Economics was held at Ames, Iowa, July 6-20, 1910. As was the case with earlier sessions, the date was selected so that it would fall within the period covered by the Graduate School of Agriculture in order that advantage might be taken of the numerous courses offered which would interest Home Economics workers. The usual arrangements were made so that attendants at either school could have the benefit of the work of the other.

The program of the school follows:

Wednesday, July 6.

- 2-3 p. m.—Lecture, Miss Caroline L. Hunt, Office of Experiment Stations, U. S. Department of Agriculture, The Scientific Basis of Progressive Legislation Affecting Welfare of the Home.
Evening.—Joint meeting with the Graduate School of Agriculture.

Thursday, July 7.

- 11-12 a. m.—Dr. Chas. E. Marshall, Professor of Bacteriology and Hygiene, Michigan Agricultural College, A Review of Intestinal Bacteriology.
2-3 p. m.—Dr. R. E. Buchanan, Professor of Bacteriology, Iowa State College, Bacteria in Relation to Food Poisoning.
8 p. m.—Formal Opening, Address of Welcome, Dean C. F. Curtiss, Iowa State College, Address by Director A. C. True, Office of Experiment Stations, U. S. Department of Agriculture, Educational Problems in Home Economics, Addresses by President H. J. Waters, Kansas State Agricultural College, and Mrs. Alice D. Feuling.

Friday, July 8.

- 11-12 a. m.—Dr. W. A. McKeever, Professor of Philosophy, Kansas State Agricultural College, Improving the Crop of Children.
2-3 p. m.—Dr. McKeever, Eugenics.
Evening.—Joint meeting with the Graduate School of Agriculture.

Monday, July 11.

- 11-12 a. m.—Prof. M. Mortensen, Iowa State College, Classification of Ice Creams.
2-3 p. m.—Miss Elizabeth C. Sprague, University of Chicago, The Causes of Flavor in Meat. (A report of the results of original investigation.)

Tuesday, July 12.

- 11-12 a. m.—Miss Hunt, The Scientific Basis of the Campaign against Flies.
2-3 p. m.—Dr. H. T. Vulte, Professor of Household Chemistry, Teachers College, Columbia University, Chemistry of Textiles. (First lecture.)

Wednesday, July 13.

- 11-12 a. m.—Dr. B. H. Hibbard, Cost of Living on the Farm.
2-3 p. m.—Dr. Vulte, Chemistry of Textiles. (Second lecture.)

Thursday, July 14.

- 9.30-10.30 a. m.—Prof. Mortensen, Ice Cream Manufacture.
11-12 a. m.—Dr. B. H. Hibbard, Cost of Living on the Farm. (Second lecture.)
2-3 p. m.—Dr. Vulte, Chemistry of Textiles. (Third lecture.)

Friday, July 15.

- 9.30-10.30 a. m.—Dr. C. F. Langworthy, Expert in Nutrition, Office of Experiment Stations, U. S. Department of Agriculture, Report of Literature on the Physiology and Chemistry of Fatigue, with Suggestions as to the Possible Use of the Calorimeter in Further Research on the Subject.
2-3 p. m.—Dr. Vulte, Chemistry of Textiles. (Fourth lecture.)

Monday, July 18.

- 8-9 a. m.—Dr. Langworthy, A Review of the Scientific Literature on Domestic Art.
3-4 p. m.—Prof. C. H. Eckles, University of Missouri, Recent Advances in Dairy Bacteriology.

Tuesday, July 19.

- 8-9 a. m.—Dr. Langworthy, Question Box.
3-4 p. m.—Dr. Langworthy, Table Customs.

Several conferences were also arranged, one led by Miss Sprague on Exact Methods in Cooking, another led by Mrs. Feuling on New Household Devices, and one which was very largely attended at which Dr. F. L. Stevens of the North Carolina College of Agriculture spoke on Adapting General Text-Books to the Use of Rural Schools.

The committee appointed at the business meeting which terminated the Graduate School of Home Economics at Ithaca, 1908, and which had charge of the arrangements for the Graduate School at Ames, comprised Mrs. Ellen H. Richards, Miss Caroline L. Hunt, Mrs. Alice P. Norton, Miss Edna D. Day, Miss Abby L. Marlatt, Miss Martha Van Rensselaer, and Dr. C. F. Langworthy, with Miss Day as chairman. At the request of the committee Miss Caroline L. Hunt consented to go to Ames as Dean of the Graduate School of Home Economics.

The success of the school is in large measure due to Miss Hunt and to Miss Day, who had charge of the arrangement of courses and other preliminary work. Owing without doubt to unavoidable delays in completing arrangements for the Graduate School, the attendance was not quite so large as at the Ithaca meeting but much enthusiasm was manifested and it is believed that it will exercise a decided influence as a factor in advancing Home Economics work.

It is interesting to note that funds, which included a small balance from the preceding session of the Graduate School, a generous contribution from the Iowa State College, and fees from pupils in attendance, were amply sufficient for meeting all the expenses of the school.

The final business meeting of the school was held on Tuesday, July 19, with Miss Hunt in the chair. The principal subject for discussion was the future of the Graduate School of Home Economics. In view of the fact that the agricultural colleges constitute the largest group of institutions of collegiate grade giving courses in Home Economics, it seems very fitting that the biennial Graduate School of Agriculture should include courses in this subject as well as in the other branches taught in the agricultural college. Should such an arrangement prove feasible, an opportunity would be provided for graduate work in Home Economics at regular intervals. It would not then be necessary to continue the Graduate School of Home Economics along its present lines as an independent enterprise, as all the advantages gained by the present coöperation with the Graduate School of Agriculture would of course be secured. Accordingly, the following resolution was adopted and submitted to the Association of Agricultural Colleges and Experiment Stations, to be referred to the committee for the Graduate School of Agriculture in charge:

"Inasmuch as the agricultural colleges constitute the largest group of collegiate grade in the United States giving courses in Home Economics, we, the Graduate School of Home Economics, request that in planning the work in the future, the Graduate School of Agriculture offer a section of Home Economics that the needs of the women students be as fully met as those of the men.

"The Graduate School of Home Economics, after several years of separate organization, has become a part of the American Home Economics Association, and can assure the Graduate School of Agriculture that the American Association of Home Economics will coöperate in every way and will work for the benefit of the Home Economics section which we hope may be formed."

As there was no way of knowing whether or not the Association of Agricultural Colleges and Experiment Stations would find it possible to follow out the plan suggested, it was deemed advisable to make arrangements for the continuance of the Graduate School of Home Economics under other circumstances if necessary, and with this in view it was voted that it be formally taken over by the American Home Economics Association and become in reality what it has been in effect, a part of that organization. In order that provision might be made for all contingencies, the permanent committee for the Graduate School of Home Economics was continued, the former members being re-elected, with the addition of Mr. Alice Dynes Feuling as chairman of the committee, the full list of names being as follows: Mrs. Ellen H. Richards, Miss Caroline L. Hunt, Mrs. Alice P. Norton, Miss Edna D. Day, Miss Abby L. Marlatt, Miss Martha Van Rensselaer, Dr. C. F. Langworthy, and Mrs. Alice Dynes Feuling.

The Chairman spoke of the indebtedness of the present session to the many who helped to make the Ames meeting successful, and the following resolution thanking the Graduate School of Agriculture, the Iowa State College, and others who had contributed to the success of the meeting, was adopted:

"The Graduate School of Home Economics in closing its session at Ames from July 6-19 [1910], wishes to express its profound appreciation to the Iowa State College and its faculty, particularly to the Department of Home Economics, to the Iowa Experiment Station, its dean and staff; to the Graduate School of Agriculture, its dean and faculty; to the Priscilla clubs and others who have so measurably contributed to our comfort socially; and to those managers of the excursion to Odebolt and the surrounding region, and to the many who so loyally served us throughout the day.

"We further wish to thank Miss Hunt for her services as dean of the Graduate School of Home Economics and to all lecturers and instructors who have contributed toward the success of the school."

The meeting then adjourned and this business meeting closed the Graduate School of Home Economics.

SECTIONAL CONFERENCE ON HOUSEHOLD AND INSTITUTIONAL MANAGEMENT.

Following an invitation from the Lake Placid Club, an important conference of members of the American Home Economics Association engaged in household and institutional administration, or in related teaching fields, was held at the Lake Placid Club, Essex County, New York, from Tuesday June 28 to Saturday, July 2, 1910

The formal program for the conference was announced in full in the June number of the JOURNAL.

At a business session held on the closing day, the following were chosen as an executive committee: Mrs. Melvil Dewey, Lake Placid Club, Essex Co., N. Y., chairman; Miss Adelaide Nutting, Teachers College, Columbia Univ., New York City; Prof. Wm. Morse Cole, Harvard University, Cambridge, Mass.; Miss Martha Van Rensselaer, Cornell University, Ithaca, N. Y.; and Melvil Dewey, Pres. Lake Placid Club, Essex Co., N. Y.

Committees were also appointed, as follows:

On Existing Demands in Institution Work, Miss Martha Van Rensselaer, chairman; Administration, Mrs. Melvil Dewey, chairman; Curriculum for Training for Institution Management, Miss Lydia Southard, Teachers College chairman, and Miss Florence Corbett, Teachers College; and Resolutions, Dr. Benjamin R. Andrews, Teachers College, Miss Maude Gilchrist, Mich. Agricultural College, and Mrs. Olaf N. Guldin, chairman Home Economics Department, General Federation of Women's Clubs, Fort Wayne, Ind.

Among the resolutions reported by the Resolutions Committee and adopted were the following:

(1) It is significant that this first conference should meet at the same place and under the same auspices as the first conference on Home Economics a decade ago. We congratulate Mr. and Mrs. Dewey on their services to the cause, and we hereby express our appreciation of their great contribution to the work.

(2) (a) That the conference emphasize the ideals of rational living in home, institution and community life; (b) that we utilize all proper methods to advance these ideals in education in both elementary and higher schools; (c) that we urge the necessity of a professional training for those concerned in household and institution management; (d) that we work for increased government support

of scientific investigation in this field, and a similar provision in universities and technical schools; (e) that we arrange for the preparation and dissemination of needed literature on institution management; (f) that we organize and assist meetings and conferences where these subjects are considered, so that the public may realize their importance as a basis of conservation of human life, as well as of material resources.

(3) That the conference records its conviction of the great importance of sectional conferences like this dealing with definite divisions of Home Economics as well as the general meetings whose programs include the whole field of Home Economics, and that we request the committee on institution management to arrange for a conference in 1911.

(4) That we express our appreciation of the great value of the JOURNAL OF HOME ECONOMICS, and urge our members to extend its circulation among institutions, libraries, clubs and individuals who will find it valuable as the authoritative publication in the field of home and institution management.

That the executive committee of the American Home Economics Association be requested to consider the possibility of adding some supplementary phrase on the title page of the JOURNAL which shall express its relation to the institutional field—for example, "JOURNAL OF HOME ECONOMICS—Home, Institution, Community."

(5) That the conference approves the proposed federal legislation providing national support for education in Home Economics; specially that we urge favorable action by congress on the Davis-Dolliver Bill which will extend support to secondary and normal education in Home Economics.

(6) That the executive board of the section be authorized in the interval between its meetings to act on any matter which four-fifths of the board agree shall not be postponed till the next meeting, and where the action proposed correctly represents the majority sentiment of the section.

(7) Resolved that the members of this conference express their sense of loss in the death of Mrs. Adelaide Hoodless who so long and ably promoted the cause of Home Economics education in Canada.

HOME ECONOMICS AT THE GENERAL FEDERATION OF WOMEN'S CLUBS.

At the tenth biennial convention of the General Federation of Women's Clubs, held in Cincinnati, May 11-18, the chairman of the standing committee of Home Economics, Mrs. Olaf Guldin, of Fort Wayne, Indiana, reported that 720 clubs had held one or more special sessions on Home Economics during the two years, that 371 had regularly established departments of Home Economics, 278 had had lectures, demonstrations or short courses, and 258 helped in creating sentiment toward Home Economics in the public schools, while 104 had done educational or philanthropic work in cities.

The committee made the following requests of clubs:

(1) To have each club devote one or more sessions to Home Economics; (2) to have Home Economics books put into the public schools; (3) to have Home Economics taught in the public schools; (4) to have one session of each convention devoted to the subject; (5) to coöperate with state universities and agricultural colleges to secure Home Economics teachers for carrying on short course work and lectures; and (6) to keep this committee informed by reports, programs and outlines on whatever is accomplished.

Miss Crooks, of Milwaukee-Downer College, gave a lecture upon textiles, illustrating by samples the work of laboratory investigation of adulterated fabrics. Miss Crooks made a plea for the same attention to the regulation of the sale of textiles which has been secured for food adulteration. Miss Mary F. Rausch, of the Colorado Agricultural College, presented a paper on Domestic Science, and also explained the scope of the extension work in Colorado. Miss Martha Van Rensselaer, of Cornell University, gave a stereopticon lecture on the field of Home Economics, using a series of slides to show the work presented in the institutions of the country.

Throughout the entire meeting of the Federation lectures and discussions relating to Home Economics were presented by different committees. The food sanitation committee introduced Dr. Harvey W. Wiley, of the U.S. Department of Agriculture, and health commissioners from several central states. The art committee had a lecture on practical application of art principles to domestic and municipal life. Dr. Alvin Davison, of Lafayette College, spoke on the Drinking Cup as a Source of Disease. Social Hygiene and the Economic Conditions Governing the Condition of Women and Children formed a part of another session.

EDITORIALS.

We wish to call attention to the special feature of this number, the papers on the teaching of Domestic Art which were presented for the most part at the Boston Meeting of the Education Section. Other papers will appear in the next number. This is the fulfillment of our promise made in the spring to those teachers and students interested in this branch of Home Economics, and we are certain that in the number and excellence of these papers and discussion they will find their reward for the delay. It is hoped that these papers will stimulate discussion on this important subject and we shall be glad to receive additional papers and criticisms.

The American Home Economics Association may congratulate itself that in this, the second year of its existence, it has held nearly all of those who joined its ranks in 1909 and has added to its membership over three hundred new names. This has been done without advertising or other effort except what has been put forth by interested members.

The Association and its organ, the *Journal of Home Economics*, has thus far existed almost solely for the development and instruction of its members, a large part of them teachers of Home Economics in our schools. Through their conventions and summer schools and lecture courses the Association has become known to teachers of these branches, but outside this natural means of communication it has not been easy to spread the news that a national association has been formed "to improve the conditions of living in the home, the institutional household and the community." Homemakers, workers in institutions, friendly visitors among the poor, when shown a copy of the *Journal* are often heard to express surprise and pleasure to learn that such help is at hand. The Association is meeting a great modern need, its *Journal* voices an irresistible movement which calls for "teaching the practical efficiencies of living to both sexes."

That the Association should rightly lead this movement is of immense importance and how it is to do so has been made the subject

of careful thought by our governing council. In the first place its membership must be greatly extended. Our main reliance in bringing this about must continue to be those who are already interested in its aims, but in order to reach the larger reading public a campaign of publicity must be undertaken which will require larger funds than our membership dues furnish. The Council has decided to admit into the pages of the *Journal* a moderate amount of carefully selected advertising and it is hoped that the income derived from this source will also make it possible to issue the *Journal* more frequently, probably as a monthly with the exception of the vacation months and give to its readers some eight hundred instead of, as now, five hundred pages of reading matter yearly. The dues will continue to be \$2.00 a year and will be received for the calendar year only.

We wish to thank most heartily those of our members who have responded to our call in the June number for Nos. 1 and 2 of Volume

Back I. Cash or credit has been given in all cases, except a few in which the *Journal* was unaccompanied by name. We need still more copies of these
Numbers. numbers especially to fill the orders from libraries for complete sets.

Readers of the *Journal* will please note that accompanying this
Title Page number we send title page and index for Volume
and Index. I, 1909. The Index for Volume II will be printed with the December number.

During the summer three notable meetings were held at which papers were presented of great interest to our members. The first
The Summer of these meetings was held at Lake Placid, N. Y.,
Meetings. June 28 to July 2, on Institutional Management, and it called together some fifty people, many of them heads of institutions, dietitians, or others who had expert knowledge of the subjects discussed. So important and numerous were the papers presented that it has been decided to issue them in a special "Institutions Number" which will appear in November and be sent free to all members of the Association. Lists of the officers chosen and the resolutions adopted will be found elsewhere in this number of the *Journal*.

The second meeting was that of the Education Section held in conjunction with the National Education Association Convention in Boston, July 2-8. This was attended by some three hundred people and a large number of the interesting papers presented on the subject of domestic art will be found in this number of the *Journal*. Others will appear later.

Elsewhere in the current number will be found a report of the session of the Graduate School of Home Economics which met at Ames, Iowa, July 6-20.

It now seems probable that the annual meeting of the American Home Economics Association will be held during the Christmas vacation at St. Louis, Mo., in conjunction with the American Economic Association. The full program will appear in the December number of the *Journal*.

The Annual Meeting. Home Economics Association will be held during the Christmas vacation at St. Louis, Mo., in conjunction with the American Economic Association. The full program will appear in the December number of the *Journal*.

December Number Free. All those who join the Association before January next will receive free the December number containing the full program of the annual or midwinter meeting

NEWS FROM INSTITUTIONS.

Some idea of the meaning of the title of the new normal training school, established by the California legislature in the spring of 1909, can be gleaned from the perusal of the first section of the bill which provides that: "There is hereby established in the city of Santa Barbara, county of Santa Barbara, a state school to be known as the Santa Barbara State Normal School of Manual Arts and Home Economics. The purpose of this school is to furnish to the people of both sexes such professional training in manual arts and Home Economics as shall fit them to teach in the public schools of this state in the departments of manual arts and Home Economics. This act shall be liberally construed to the end that the school established hereby may at all times contribute to the high standard of professional training in the state."

This school, the first of its kind in the United States, was formally organized on July 10, 1909, by Governor J. N. Gillett, State Superintendent of Schools Edward Hyatt, and the board of trustees, five in number, from the state at large. Santa Barbara was granted this school "that the state might show appreciation of the late Miss Anna S. C. Blake, who established in this city in 1891 the first domestic science and manual training classes on the Pacific Coast.

A beautiful site had been given by public-spirited citizens, and August 30 named as the date for opening the school in the Anna S. C. Blake Memorial Building, generously appropriated to the state's use by the Santa Barbara board of education. It was decided to establish the two departments which should meet the most insistent demand for teachers—manual arts, and domestic arts and domestic science, for primary and grammar grades. The city further permits the use of its splendid equipment and admits of all the practice teaching in its long established, well conducted classes in the above mentioned subjects. Only the simplest advance notices were possible and yet an astonishing number of inquiries were received, showing that the general public, as well as the progressive teacher is awake to the demand for the trained instructor in manual training and domestic science.

There being only the one special school in the state it will eventually present all the kindred subjects grouped under its comprehensive title and its students will, in a sense, be post-graduates, since entrance credits are based on the following general requirements: Graduation from a college, university, normal or special school; certificate of attendance for two or more years in such schools, with recommendations from the same; or successful teaching experience, with satisfactory testimonials. Elementary chemistry and the sciences included in the high school course of study are prerequisites for the Home Economics course.

The directors of long established institutions gladly welcome a new training school that is not lowering the standards they have worked so long and earnestly to establish. The course of study here is full and the plan of work is thorough, practical and calculated to meet individual needs.

A year hence will see the beginning of the erection of the permanent school building and the structure will be an exemplification of what the school is to stand for—proportion, simplicity, fitness. Standing on the ridge of the hills surrounding the city, silhouetted against the highest peaks of the Santa Ynez Range, overlooking the city and the broad blue Pacific Ocean beyond, the building will have a location even more commanding than the old Franciscan Mission famous in Santa Barbara's early history.

Two stories in front for offices, assembly, and library; one story on the other three sides; built around a court with all the rooms opening into the sunshine and all so placed as to have the right exposure for light, attendance therein will be a pleasure. The equipment will grow gradually of course, meeting the needs of the state as its work increases. The school year, divided into quarters, will bring people from all sections and the mingling of interests will be of incalculable value.

Student graduates of normal schools, colleges and universities will come into the Home Economics department here for their year or more of training in methods for grades and for high school. The Santa Barbara student will often spend summer vacations at the universities, getting more and more insight into the sciences and a larger conception of the economics of living.

Here may come the men and women who will teach manual arts in the grades—it may be clay modeling, pottery, bench work, metal work, wood carving, with the accompanying knowledge of design or sewing, dressmaking, millinery, textiles, etc.—all will find the instruction needed. Supervisors of primary handwork and teachers of design studying here may know the relative value of their work, in comparison with the high school shop-work and the trade-school practice.

The duration of courses will naturally vary, but the school will exact of its applicants standards, fitness, good health and ability to carry the chosen line of work. The state needs good teachers and rather than place in each of its five established normal schools a department of special training it is wisely concentrating its forces, equipment and faculty, under one administrative head.

The personnel of the classes this first year is delightful. There are no "specials." All met the entrance requirements and all are meeting the standards. They come from Hawaii, Washington, Illinois, Montana, Arkansas, Colorado, Oklahoma, Iowa, Michigan, New York, and from more than a dozen cities in California. Most of them want to remain in California and there is a promising outlook for them all.—EDNAH A. RICH, *President*.

Bradley Institute offers two courses in domestic economy. One is a part of the regular high school course, every girl being required to take both sewing and cooking. The other is a two-year course for those wishing to specialize in the branches relating to home-making, either for their own use or for the purpose of teaching domestic economy, and for entrance to which a four year high school course or its equivalent is required.

In this course opportunity for strong science work is provided, and electives in other departments of the college are open to those desiring such work. A close connection with the manual arts department is maintained in various ways, notably in the design applied in art needlework and other modes of interior decoration, and in a course known as house construction, sanitation and decoration, in

which this year the construction was given by the head of the manual arts department, the sanitation by the head of the domestic science department and the decoration by one of the art teachers. Sufficient training is given in mechanical drawing and in perspective to enable the students to make very creditable drawings of floor-plans and elevations, and an interior view of one of the rooms is done in color by each student to indicate furnishing and decoration. The houses thus planned are made the basis for the study of cost of living in the course in household administration which follows.

The students are much interested this spring in a practical problem in house furnishing, made possible by the decision of the trustees of the institute to give the department the use of a cottage situated just to the rear. In this will be carried on next year the practice work in the various household processes such as cleaning, laundering and the serving of meals, and housekeeping will be studied under the conditions of the ordinary home. This will supplement the work done in the laboratory and class rooms of the institute and will give additional opportunity for practice and experimental work.

The furnishing of a laundry, kitchen, dining room, bed room, and living room in an attractive and suitable way for a moderate expenditure is the problem upon which the students are enthusiastically at work.

In the domestic art department, courses in millinery and embroidery have been added this year. In connection with the former a very good exhibit of spring hats was held. It is expected that many evidences of results in art needlework will be visible in the new cottage.

The teaching staff of the department is as follows: Helen Marion Day, B.S., Assistant Professor in Domestic Science; Elida Esther Winchip, Instructor in Domestic Economy; Martha Shopbell, B.S., Instructor in Domestic Economy; Bertha May Scullin, A.B., Instructor in Domestic Economy; and Alice Evans Blair, Assistant in Sewing.

Miss Mary F. Rausch, head of the Department of Home Economics, recently writes as follows:

“U. S. Senator Guggenheim has given \$45,000 for a new Home
Colorado Economics building. The corner stone was recently laid, and we
Agricultural hope to get into the building by October. The program included
College. a talk by Governor Shafroth and an address by Mrs. Sarah
Platt Decker.

“Miss Inga Allison, who was formerly at Lake Erie College, and who has been with me for the past two years, has resigned. She has taken up a claim and will spend the next year in developing the house and land. Miss Maud Propst, of Rockford College, has been appointed as instructor in this department for next year.

“This has been a very satisfactory year. We doubled our attendance. We hope next year to have a large enrollment of girls. The school of agriculture, which was put in here for the first time this winter was a decided success, having had 200 students enrolled.

“We have started a new move here for this summer. The college is sending out members of the faculty to the various teachers' institutes to show the teachers how to teach agriculture, nature study and domestic science in the rural schools

and lower grades with very little money or equipment. We think it is a step in the right direction. As soon as people know more about domestic science, they will know that it must be put into every school in the country."

The opening of a new department of domestic science is something like the "hanging of the crane," since it aims to be a center of harmony, order and thrift.

Eureka College. Such a department was opened in Eureka College, Eureka, Illinois, last year, in charge of Mrs. Evaline C. Compton. Great interest was shown by the students, and considerable correlation with the work of other departments was accomplished. Further extension of the domestic science work is contemplated during 1910-11.

The department of domestic economy will begin the year of 1910-11 on a revised and considerably enlarged plan of work. The course is placed on a more logical basis, and several subjects, new both to domestic art and domestic science have been added, thus offering a very complete list to the young women of this yet new state, a good number of whom are already enrolled. Registration at the present time numbers 75 against 50 of last year. A growing interest is manifested in the department work both among the students and the people outside.

The course covers 136 credits and requires four years. For the first two years in addition to 56 credits for science, language, history and other cultural subjects, 4 credits are allowed for drawing, both form study and color and design, 2 credits for hand sewing, and 2 credits for machine sewing in the first year, and 4 credits for cookery, 4 credits for food lectures, and 2 credits for advanced sewing the second year. The last two years offer the following:

JUNIOR YEAR.

<i>First semester:</i>	Credits	<i>Second semester:</i>	Credits
Psychology.....	3	School administration.....	2
Bacteriology.....	5	Zoölogy or botany.....	4
Physiology.....	2	Bacteriology.....	3
Junior cookery.....	2	Hygiene.....	2
Dressmaking.....	2	Junior cookery.....	2
Household art.....	1	Tailor work.....	2
Textiles.....	1	House sanitation.....	1
Household law.....	1	Fine hand sewing.....	2
Laundering.....	1		

SENIOR YEAR.

<i>First semester:</i>	Credits	<i>Second semester:</i>	Credits
Vertebrate histology.....	2	Vertebrate histology.....	2
History of education.....	3	Education (elective).....	2
Art needlework.....	2	Art needlework.....	2
Invalid cookery.....	1	Millinery.....	2
Emergencies and home nursing..	1	Senior cookery.....	2
Practice teaching in sewing....	2	Electives.....	3
Practice teaching in cookery....	2		

Thus far only two students have been graduated from the course, with the degree B.S. The incoming classes promise, however, a fine increase of graduates in the immediate future.

Like all new universities, the work is being carried on under the hampering conditions of a state still in the making, but with the seemingly unlimited resources of the western country success is assured in a shorter time than would be possible in an up-to-date eastern university. The prospects ahead, therefore, seem encouraging in the extreme.—JENNIE L. K. HANER.

The department of Home Economics has entered into a relation of exchange with the Brokaw Hospital, Bloomington, Illinois, by virtue of which the nurses in the hospital training school receive instruction in cookery for the sick from the department of Home Economics, while the students of this department receive instruction from the nurses in bandaging, bedmaking, the care of the sick room, and what to do until the doctor comes. Miss Ina K. Pitner (Teachers College, 1908), who is in charge of the work, says that quite in opposition to orthodox commercial principles, there is an ardent rivalry between the college and the hospital as to which shall give the more to the other.

A two-year course leading to a certificate, and a four-year college course leading to the degree of Bachelor of Science in household economy, is offered in this department of the university.

From the Illinois Woman's College, Jacksonville, Illinois, comes the following report from Miss Grace M. Viall (University of Chicago, 1906):

"This fall we realized that we did not have as pretty a set of dishes as we desired for our senior dinners, so the junior class in cookery came to the rescue and gave two sales. With the proceeds we purchased and presented to the senior class, a beautiful set of Haviland china.

"Perhaps you will be interested in our sales. The first one was a pancake and waffle sale. Each student had either a pancake griddle or a waffle-iron, and a bowl of batter. The orders came so rapidly that every student was kept at her post for two hours. We served one waffle for ten cents and three cakes for the same price. For five cents extra we gave a cup of coffee. Our second sale was a doughnut and coffee sale. The girls made five hundred doughnuts which disappeared within one hour after being placed on sale. Our sales are well patronized and are very popular with every one.

"I have found that the sales are valuable from three stand-points: first, they give the students practice in handling materials in large quantities; second, they afford opportunity for students to exercise executive ability; third, they create enthusiasm in the work, as the girls are anxious to produce results which are a credit to the department. We are planning more sales for the future. Among them are to be salad and strawberry short-cake sales. We will combine our lessons in frozen desserts with sales. We are going to collect freezers from our friends in town and each girl will have the practice of making and freezing large amounts of creams, ices and sherbets. After the lesson the creams will be sold."

Miss Bertha Miller, a 1908 graduate of Teachers College, has inaugurated a series of "faculty luncheons," served at a cost of from eight to ten cents per person by the students of the department of domestic economy to the members of the faculty. "Luncheon day" comes once a week, and the number of guests is limited to thirty. At first, Miss Miller says, it was difficult to secure so many, but now they have a waiting list, and the meals are highly praised and enjoyed. Miss Miller has also organized a Home Economics club, open to students of domestic art and domestic science. Through this club several lecturers have been brought to the college to speak on various problems of home administration.

The *Iowa Homestead* for July 7 gives an interesting illustrated account of the movable schools of Home Economics sent out by the extension department, under the direction of Miss Frances Brown and Miss Ula Dow. Each school continued for one week in a locality, the equipment and supplies being furnished by the local community, usually through the farmers' institute organization. An advance enrollment of not less than fourteen or more than twenty-four, all at least fifteen years of age, is required, and generally a membership fee of one dollar is charged.

Cooking lessons are given each morning and sewing lessons each afternoon. There are also conferences at 4 p. m. daily, open to the housewives of the community. These are very largely attended, sometimes as many as 200 being present.

The results of the school work are regarded as very encouraging. Over 400 people were enrolled at the fourteen schools held during the spring. Most of them were women, though there were many young girls, and the ages ranged from fifteen to sixty-five.

In a recent letter, Miss Rachel H. Colwell writes as follows:

"My problem here is concerned with offering courses in household science in the department, which ranks with the other science departments in the college. There is no attempt made to offer professional courses, or especially to train teachers, any more than is done in physics or chemistry. The aim is eventually to have the courses open to Juniors and Seniors who will elect the work as the rounding out of the pure science courses.

"It is felt that this is the only way that the courses can receive academic credit in a girls' college, leaving a different treatment of the subject for the university and the agricultural college."

Miss Mabel Wellman writes as follows:

"One course in which I am particularly interested is the one on economics of the house. The object is to set the students thinking along a good many lines. We begin with a study of the evolution of the house and family life. Starting with the most primitive types, the tree dwellers, we picture their probable every day life, in caves and huts. Primitive implements and industries are dwelt

upon, and a visit to the Field Columbian Museum with its many models of savages of different kinds employed in all sorts of occupations gives reality to the picture. Lake dwellings, cliff buildings, and pueblos are studied, and specimens of early implements and utensils examined. Next we study the probable influence which the following of ancestor worship had on the organization of the family and how it helped fix the position of women in the Aryan race. Then we study family life of the classic period in Athens, Sparta, and Rome, in a good deal of detail, contrasting with it early Semitic life as shown in the Old Testament. We trace the effect which early Christianity had upon the position of women, then the influence of feudalism, and the rise of chivalry. We stop for a study of home life in England in the Middle Ages, comparing it with civilization as we had found it in Rome. Then we study the different great periods of industry as they arose in England. For modern problems we read such works as Veblin's *Theory of the Leisure Class*, Stetson-Gilman's *Women and Economics*, and *The Home*, Richardson's *The Woman who Spends*, and enough political economy to take up questions in regard to private property ownership, and competition versus socialism. Along with this has come debates on woman suffrage, on the relation of woman to industry, and on the organization of modern homes including the servant problem. The last part of the course is devoted to the study of the cost of living, as portrayed in family budgets, and the division of the family income."

At the Summer School of Agriculture and Country Life, held July 11 to August 12, an innovation was the introduction of Home Economics courses. Three courses were offered, a four-week course in domestic science for rural school teachers, a four-week course of a more general nature in domestic science and Home Economics, and a two-week course in household science, given especially for the wives of clergymen attending the summer school. In each case three lectures and two demonstrations were given weekly. The work was in charge of Miss Harriet B. Rinaker of the University of Illinois, assisted by Miss Howe. All of the courses were largely attended, and much interest was evident in the offering of this work by the institution.

At the second summer session, held from July 5 to August 12, courses in practical cooking and home management were offered under the direction of Miss Caroline E. Alden. Other courses of special interest to Home Economics students were those in metal craft and elements of pottery and modelling and in rural sociology.

Miss Edna D. Day, for several years in charge of the Department of Home Economics, has accepted the professorship of Home Economics at the University of Kansas. Miss Louise Stanley, who was for two years an instructor in the Department of Home Economics, and who has been away on leave of absence the past year completing her work for the degree of Ph.D. at Yale University, is to be in charge of the department next year.

The four-year course in Home Economics leading to the degree of B.S. organized last fall has been heartily received by the young women of the college. There has previously been a two-year course of high school grade, initiated when the college was founded twenty years ago. At present **North Dakota Agricultural College.** three courses are available, the college course, the high school course, and the homemakers' course. Last term 239 girls were enrolled in these three courses.

The college course is preceded and accompanied by a very thorough course in chemistry, physics, bacteriology and other allied sciences. While it was originally the intention to train for homemaking only, there have been so many requests for teachers for first class high schools that it has been necessary to include training for Home Economics teachers. These girls may elect subjects in the department of education.

The high school course is a preparatory course and on its completion the girls may enter the freshman year of the college.

The homemakers course is intended to meet the needs of our agricultural population. Labor is scarce and work so congested during the spring and fall months that it is impossible for many of the children of the best citizens of the state to enter at the beginning of the regular school year. Therefore, in order to make possible the attendance of these girls, whose parents are willing and anxious to give them educational advantages, a course has been established beginning the latter part of October and continuing five months for three years. The work is practical and includes sufficient chemistry, biology and other allied subjects to make the work in Home Economics effective. The department employs five regular teachers, one of whom is a graduate nurse who gives instruction in home nursing and hygiene for women.

Ceres Hall, the new women's building is to be occupied this fall. It has a frontage of 165 feet and is four stories high. This building is strictly modern, and contains three large kitchen laboratories, three sewing rooms, a laundry class room, a lecture room equipped with stereopticon, demonstrating table, etc. There is also a model kitchen, pantry and dining room where practical instruction will be given in planning, marketing, and preparing and serving family meals. One room is to be fitted up for instruction in home nursing. Because of the rigid winters the board of regents has made Ceres Hall sufficiently large for both the dormitory and Home Economics department. In connection with the dormitory is a dining room with seating capacity for four hundred. This gives an exceptional opportunity for the study of institutional housekeeping.

The Home Economics department has begun cooperating with the college extension work this year. The head of the department has lectured at a number of the high schools of the state. A car was also fitted up in the agricultural exhibit train which was sent out in June by the Northern Pacific Railroad under the auspices of the farmers' institute. This was the first attempt at introducing the movable school. It included a large exhibit of cooking and sewing and devices for making housekeeping and homemaking on the farm less irksome. Lectures were given in three towns each day, and the venture proved very successful.—JESSIE M. HOOVER.

This institution has recently been established at Cheltenham, Pa., with Miss Jane B. Haines as principal.

The school grounds already contain an apple orchard and a vineyard, and it is planned to have the students assist in laying out other gardens and orchards. It is also planned to erect green-houses at an early date. For the present, accommodations are available for not more than ten students.

A two-year course, continuing with brief intermissions throughout the entire calendar year has been arranged. The chief studies are horticulture, botany, chemistry, marketing of produce, agricultural bookkeeping and correspondence, garden carpentry and greenhouse construction, preserving of fruits and vegetables, bee keeping, poultry raising and elements of surveying and garden design. A high school education is a pre-requisite for admission and certificates are given upon the satisfactory completion of the course.

A course in Home Economics was included in the curriculum of the recent summer school, three hours a day being given to lectures on foods, sanitation and household management.

Rhode Island College. The present school year opens with a large enrollment. Domestic art has been added to the course, one year being required and the second which includes textiles and tailoring being elective. Much new apparatus has been installed, and the facilities for work have been increased by the equipment of a suite of rooms including office, sewing room and lecture room.

Cookery demonstrations and social service are combined for the Rockford College students, Rockford, Illinois, in a scheme planned for them by the department of Home Economics in conjunction with the city Y. W. C. A. At the noon hour in the factories the students take turns in giving chafing dish demonstrations of cookery to the factory girls in different shops. The management very kindly coöperates in providing a room, a demonstration table, and other facilities, and the girls are all given a copy of the recipe and a taste of the dish. In the department of economics in the college at the same time the Home Economics students are studying labor conditions, factory systems, etc., and are doing field work in the very factories where they demonstrate.

One of the leading schools of Home Economics in Utah is located at the agricultural college. In order to meet the needs of the state it has been necessary for the present to combine high school and college work at this institution. High schools are being erected rapidly in Utah towns, however, and work in domestic science is generally being included in the curriculum.

Agricultural College of Utah. In 1909 the legislature appropriated a large sum of money for the remodeling of the college dormitory and this entire building was given over to education for the young women. In the renovation neither effort nor money was spared and the old "beanery" as it was then called by the college youths was transformed, under the

able direction of Miss Ellen A. Huntington, into the finest building with modern equipment for the purpose in the west.

The building itself is a large white brick four-story and basement structure, and it stands on the brow of the hill overlooking the picturesque little town of Logan. The walls are finished with sand plaster and tinted in soft colors, mostly tans and browns. Oregon fir, stained a dark brown, has been used throughout in the wood work.

The work of the Home Economics department is subdivided into the domestic science and domestic arts departments, and a further division is made for the high school and college students.

In two large kitchens the girls are given practice in cooking with gas, electricity and coal. These laboratories also offer a basis for discussion of the cost of equipment as one is more expensively equipped than the other, having electrical apparatus and carrara glass table tops and blue enameled ware, while the other has gas, wood table tops and grey enameled ware. The same work is given in each. Frequently the governor and trustees visit this institution; and on such occasions the Home Economics department serves lunch.

Opening off this kitchen is a large dining room finished in hardwood with oak furnishings especially designed and constructed by the mechanic arts department of the college. These are hand carved, the sego lily (the state flower) being used in the design. Two chemical laboratories afford opportunity for work in the chemistry of foods, textiles, and research. One laboratory is devoted to experimental work entirely; this is equipped with electricity and gas in such a way that new devices may be tested from a practical and economical standpoint.

The domestic arts department is provided with plenty of light airy rooms for its work. A large sewing room and a dressmaking room are furnished with tables and chairs and with machines of various makes. There is also a millinery room where the high school girls get training in this phase of the work. Besides these rooms there are offices on each floor, a library furnished with carved furniture designed and constructed by the mechanic arts department, a rest room, class rooms, room for museum material, laundry and locker rooms.

The health of the girls has been an important consideration. An electric elevator has been put at their disposal, and baths and showers afford great pleasure to the girls after special gymnasium work.

With a building so thoroughly equipped and a location so ideal, the courses have been arranged, not only to meet the needs of the students but also to maintain the highest college standard. The four years' college course leads to a degree of B.S. The high school courses offer work in sanitation, cooking, sewing, home nursing and millinery. The college work takes up food from the manufacturing, chemical, and economic standpoint. A course in nutrition and dietetics is also given. The fine arts department and the domestic arts department work together in giving a course in household art. Courses in dressmaking, and textiles where girls test the manufactured materials for adulteration and study the economic problems involved in the purchase of textiles, are offered in the junior and senior years. A course in household administration which deals briefly with the relations of the home to society, the cost of living, civic improvement, domestic service, household management, and modern tendencies in living, makes a fitting conclusion to the four years' college work. A teachers' course designed for students who expect to teach is also given.

The enthusiasm of the girls is made manifest by the work done by the Home Economics Club of the College, organized by the girls. At Christmas time a sale of Christmas cards attracted a great deal of attention as did an art exhibit of Japanese prints later on in the year.

In January a housekeepers' conference brought many women from different parts of the state. Laboratory work was offered in sewing and cooking and lectures were also given by many prominent men and women of the state. In connection with this work a "fly exhibit" was the occasion for much comment.

The agricultural college has done much toward the growth of the resources of the state through the college extension work. Almost all the small towns of the state have been reached by the extension method. Home Economics clubs have been organized in nine different localities. They are all doing splendid work and are very much interested. Regular outlines for the work are printed and sent out by the department. Recipes for the food demonstrations are given away. A great deal of interest has been taken by the ladies in a bread contest that was held in each place the extension workers visited. In seven cases out of nine the bread judged for the best was made in a bread mixer.

For Utah Home Economics means much for the individual and for society, both at present and in the future.

We graduated ten girls this year, all of whom have positions in Utah, Arizona and Idaho. Miss Mary Parmelee, who has been substituting head of the department of domestic arts for this year, is to be in Los Angeles next year. One of the domestic science staff, Miss Lizzie O. McKay, is to become head of the department at the Weber Stake Academy at Ogden, Utah. The rest of the staff at the college remains practically the same.—E. HAZEL LOVE, *Instructor in Domestic Science*.

Wellesley College.

According to a recent number of the *Boston Transcript*, a new course is to be offered entitled Bacteria, Yeasts and Molds in the Home.

The following excerpts regarding the domestic science work of this institution are taken from a recent issue of the *Birmingham (England) Weekly Mercury*:

King's College for Women.

"It is with a certain amount of diffidence that a fresh departure is made in the domain of women's work. So far, however, the authorities at King's College for Women have cause only for self-congratulation where their special courses in home science and

household economics are concerned.

"From ten students during the first year, the college course is now followed by twenty, ten of whom are post-graduate students, while nearly half of these are university post-graduates. There is no fear now of lowering the standard of academic learning by using the knowledge gained in domestic science, and the presence of ex-Newnham and Girton students in the roll of post-graduates is undoubtedly a fresh feather in the cap of those who have been striving so long to raise home arts to a university level.

"One of the best proofs of the success of the scheme has been the laurels won by the pupils. One of these, Miss G. H. Rawson, has just accepted the offer of a post in a northern secondary school to organize the new science branch, of which the

educational authorities are beginning to recognize the importance. Another ex-student has been offered the wardenship of the new home science institute in Brighton, while a successful graduate is now lecturer at one of the largest provincial high schools for girls. There is, in point of fact, far greater demand for the domestic university woman than can be supplied. High school mistresses require the very highest training nowadays on the part of assistant teachers before they consider them competent to coach the girls in science, many of whom are themselves preparing for university life. Ordinary practical knowledge of cooking and housewifery—excellent though they may be—does not exactly qualify a woman to undertake the planning of a school curriculum in Home Economics or in kitchen laboratory work any more than a knowledge of drugs enables a man to practise as a doctor, and the university student is trained to treat the whole subject from a comprehensive and highly scientific point of view.

"The university of domestic science is still too young to point to the eventual successes on the part of its ex-students which it is hoped will be theirs in the future. It is not only the polytechnic or the elementary school which requires to lay stress on the value of a knowledge of home science, on the part of future wives and mothers or future teachers—it matters little which. The modern secondary school for a higher class scholar is equally in need of domestic knowledge as a science, and the best training which can be got."

NOTES FROM THE FIELD.

This association, which was organized last November, held a meeting at the Iowa State Teachers College in Cedar Falls, from Friday afternoon, May 13, to Saturday noon. Five members of the Home Economics faculty of the Iowa State College of Agriculture and Mechanic Arts were present, besides a number of public school teachers and interested club-women.

The afternoon program gave a birds-eye view of what was being done in Iowa along the line of the household arts. Mrs. J. H. Woods, chairman of the Committee on Home Economics of the State Federation of Women's Clubs, told what the clubs were doing and what they hoped to do. Miss Neale Knowles, of the extension department of Iowa State College, gave a most helpful talk on the extension work in Home Economics conducted by that institution. A number of reports were also given on the status of the work in the public schools of the State.

Mrs. Alice Peloubet Norton, of the University of Chicago, was the guest of the association, reaching Cedar Falls in season for the dinner served at six o'clock by the young women of the Home Economics department of the college. In the evening she addressed an enthusiastic audience of about four hundred, mostly young women, on the topic, The Social Value of the Household Arts.

The morning session of the association also proved most helpful. Miss Nellie Nash, of Waterloo, gave a comprehensive outline of a high school course in Home Economics. Miss Lelia Purdy, of Iowa State College, gave helpful suggestions regarding the teaching of domestic arts in the grades and high schools, and the last half-hour of the morning was given to a question box, conducted by Miss Lulu Graves of the same institution. Many felt that more time should have been given to this part of the program.—MARY L. TOWNSEND.

In the teaching of cooking there are, as is well known, three methods of presentation, namely, the demonstrative method, where the work is done by an expert before the class; the individual method, where each member of the class having certain materials and following written or verbal directions fashions the materials into some dish; and a method which combines these two ideas. This last is the method used in the elementary schools of Washington, D. C. The manual training high schools are, however, equipped for the individual work.

In the elementary schools the class is formed into one or more groups and to each group sufficient materials are given to make a dish which will serve an ordinary family. Certain members of each group (changing each lesson) fashion this material in the presence of the other members of the group, who are often called upon to criticise, give reasons for, or suggestions regarding, the manipulation, combination or other phases of the preparation of the materials, or to contribute some interesting bit of information concerning the materials being used.

The mental activity and the interest of each member of the group is maintained, for each member feels that, though she is not actually handling the material, the success of the dish depends on her close attention to the work to prevent those who are doing it from making mistakes. Then, too, the cooks, knowing they may, by carelessness or inattention, mar the success of the dish, which belongs as much to those who watch as to those who cook, take more pains to measure correctly, to follow directions exactly and to take every precaution to insure the production of a perfect dish. In this way good habits of workmanship are formed and they are trained to appreciate their dependence on one another and a community spirit is aroused.

As the number in each class is kept below twenty each member has frequent opportunity to do the actual work and to do it as she will have to do it for a family. Moreover, as each member writes out in her own words the directions for whatever she has done or has seen done she must have a clear mental picture of every step, and this picture is made clearer by her effort to put it into words.—EMMA S. JACOBS, Director of Domestic Science.

The April number of the *Journal of the Department of Agriculture and Technical Instruction for Ireland* contains an article dealing with the administration and organization of itinerant instruction in domestic economy in Ireland, and giving

**Itinerant
Instruction
in Domestic
Economy in
Ireland.**

a description of a course recently held at the village of Clonaslee. The instruction included 20 lessons in cooking and 10 lessons in home sewing and dressmaking. Simple household accounts and the Post-Office Savings Bank were dealt with, and five-minute lectures were given on such subjects as cleanliness in dairies, the cultivation of vegetables, etc. The cooking class was held from

4 to 6 p.m., and had an average attendance of 15, and the sewing class from 3 to 5 p.m., with an average attendance of 9. The ages of students varied from 14 to 30 years, the average being 20 years.

"There is no greater blessing in this world than a steady job, with increasing efficiency and hence increasing wages as time goes on; and the only way to insure that happy state for each individual is to give him the training

**Vocational
Education.**

for some skilled vocation in life, whether it be in business, in trade, or in a profession.

"We are the only progressive nation which allows its adolescents, the great majority of them, to drift without systematic educational influence from the time they are fourteen years of age until they arrive at the threshold of citizenship, the age during which the child becomes a youth and man, the age during which the plasticity of early childhood gives place to stability, the age during which the influences to which he is subjected are likely to be permanent. We are allowing the great majority of our youth to go to waste during this period because we are not providing for them some means of deepening and intensifying their general education, and at the same time we are not giving them a vocational education that shall equip them well to do what the world expects them to do, and which means for them a career—a chance." Professor Hanus, Chairman of the Massachusetts Commission on Industrial Education.

BOOKS AND LITERATURE.

The Education of Women. Marion Talbot. University of Chicago Press, Pp. 255. \$1.25. 1910.

If the author had said, as she truthfully might have done, "all of which I saw and a large part of which I was," the reader would have appreciated more fully the sanity of view and the restrained enthusiasm with which the subject of the academic education of women is treated in the volume.

The growth of that ideal of the material to be used in the process is admirably presented as well as the changes in environment and in needs. The somewhat tardy awakening of the colleges to what has already taken place is very cleverly suggested and might have been carried still farther, but the author is for the most part loyal to academic tradition. The glimpses of past and present curricula in contrast, the bright illustrations of point of view make the book one which no college woman and no teacher of girls can afford to be without.

The Making of a Trade School. Mary Schenck Woolman. Whitcomb & Barrows. 1910. Pp. 101. 50 cts.

For the one per cent of women who go to college thirty per cent have to earn bread and butter for themselves and those dependent upon them. The lot of the widow with children to be supported is so immeasurably brighter in this century that it is somewhat strange that no novel writer has used it as the basis of a plot. Instead of being obliged to scatter her children or to starve over long hand-sewed seams, as her only resource, there are 300 kinds of work open to her with fair remuneration if her hands have been trained in her youth at a time when muscles acquire with rapidity and never forget. It is the vicissitudes of a possible future that really makes the trade school for girls an insurance against a struggling middle age. It does no harm to the girl to have skill to fall back upon, and it may be the saving of herself and her family. Even if the girl does not enter or stay in the industry a certainty of being able to do one thing well adds to stability of character. This treatise, by the organizer and director of the first experiment of its kind in the United States, gives not only the history and spirit in which the work should be done, but the details of equipment and of financial support. The social side is perhaps the most significant as showing the need of special care for the health of the working girl and the opportunity for aid in this direction.

The Revised Syllabus for Elementary and Secondary Schools. Published by the Board of Regents of the State of New York.

Household Arts appears in this syllabus for the first time as an academic subject. There is a brief outline for both domestic science and domestic art in the elementary school. The secondary syllabus in household arts will contain an

outline on clothing, one on foods, and one on household sanitation and management, including the sanitation of the house, laundering, and home care of the sick. Copies of the syllabus may be obtained on application to the New York State Education Department, State Capitol, Albany, New York.

Free Publications of the Department of Agriculture Classified for the Use of Teachers. Dick J. Crosby and F. W. Howe, U. S. Dept. Agriculture, Office of Experiment Stations, Circ. 94, pp. 29.

This circular presents a selected list of the free publications of the U. S. Department of Agriculture, classified for the use of teachers of agriculture, botany, chemistry, domestic science and hygiene, geography, physics, physiology, and zoölogy, including entomology. The publications mentioned in this list have been selected with special reference to their suitability to supplement college and school text books in the subjects mentioned. The list will aid teachers in making a more discriminating selection and use of the department publications.

About 70 publications are listed as adapted to teaching domestic science and hygiene.

The National Congress of Mothers Magazine. Published monthly, except during July and August, by the National Congress of Mothers, 147 North Tenth Street, Philadelphia, Pa. 50 cents a year; 10 cents a number.

This magazine contains articles which should be of interest to workers in Home Economics, especially those who are concerned with problems regarding the care of children. A recent number contains, among other items, articles on School Fatigue, by Helen C. Putnam, M.D.; G. Stanley Hall and the Higher Education of Women, by L. Pearl Boggs; The Mind of the Child, by Dunstan Brewer, an article taken from the *Parents Review*, an English publication of similar purpose, and one, by the way, of distinct value; and The Sunday-School, by Ednah C. Silver. In addition, the magazine contains state news and other items of information.—B. R. A.

Frauenwirtschaft, Zeitschrift für das hauswirtschaftliche und gewerbliche Frauenwirken. [Woman's Work—A Journal for Housekeepers and Trade Workers.] Paderborn. W. Liese, editor. Monthly publication, price 3 marks. 60 pp. a year. Rev. in *Soz. Praxis*, 19 (1910), No. 34, p. 942.

This journal is devoted to the special interests of women engaged in home work and in trades.

Laboratory Notes in Household Chemistry for the use of Students in Domestic Science. Hermann T. Vulté and George A. Goodell. Easton, Pa. The Chemical Publishing Co., 1910 (second edition), pp. 189. \$1.25.

There has been much objection to "hashed food" in the mental training, especially in science, but those who have tried to teach "correct form" chemistry to girls and particularly young women will agree that interest in substances with

which they have already had some contact is a great help in leading them to plod over the dry places for which they can see no possible use.

This little book begins with that most universal agent, the household fuel, and passes on to the functions of the atmosphere of water and of the metals and utensils of the common every-day living. There are eight chapters on food materials.

The laboratory experiments are so simple that any high school laboratory should furnish the equipment and any teacher of chemistry should be able to make the work interesting. The general tone of the book is good and scientific, and the references to standard works are frequent, so that it is difficult to suppose a student leaving the laboratory with the satisfied opinion that science that has been brought into the comprehension of the unscientific is all-sufficient. He will rather have a desire for more knowledge. The performance of accurate experiments and drawing of careful conclusions is an education in itself for many of the teachers who come to the work of fitting for domestic science rather late in youth and from an unscientific environment.

How to Choose and Cook the Cheaper Cuts of Beef. Anna Barrows.

Harper's Weekly, 54 (1910), No. 2774, pp. 13, 14, figs. 4.

The selection and preparation of meat and related questions are discussed with special reference to economy in the use of this class of food materials, and attention is directed especially to the fundamental principles of meat cookery. The article as a whole is an interesting and valuable contribution to the subject, summarizing, as it does, the information which the author has gathered as a result of unusually wide experience from the teacher's standpoint as well as that of the laboratory and the home.

Composition of Figs. R. Paladino. *Biochem. Ztschr.*, 24 (1919), No. 3-5, p. 265.

Fresh fig flesh, according to the analysis reported, contains 80 per cent water; 0.7 per cent nitrogenous material, 0.3 per cent fat, 16.2 per cent sugar, 1.30 per cent cellulose, 0.7 per cent ash, and 0.8 per cent gummy or mucilaginous material. The fig rind or skin contains 86 per cent water, no nitrogenous material, 0.1 per cent fat, 5.4 per cent sugar, 5.76 per cent cellulose, and 2.74 per cent gummy or mucilaginous material. Dried figs contain 57 per cent water, 4.1 per cent nitrogenous material, 2.2 per cent fat, 26.06 per cent sugar, 8 per cent cellulose, 0.18 per cent gummy or mucilaginous material, and 2.52 per cent ash.

An Outbreak of Poisoning by Arsenical Sweets. J. R. Hutchinson. *Pub. Health* [London], 23, (1910), No. 4, pp. 138-142.

Details are given of the examination by Délépine of samples of confectionery and confectionery ingredients in connection with a somewhat extended occurrence of arsenical poisoning in school children. The average amount of arsenic found in the candy was from 10 to 11 grains per pound. The investigation did not satisfactorily explain how arsenic came to be present, as the materials used in making such candies as were under consideration were not found to contain arsenic.

Important Points in Wrapping-Paper designed for Use in connection with Foodstuffs. H. Kuhl. *Pharm. Zentralhalle*. 50 (1909), No. 52, pp. 1079-1100; abs. in *Chem. Zig.*, 34 (1910), No. 25, Repert., p. 101.

The author concludes that no paper is satisfactory for this purpose unless it is well calendered with gelatin or glue. Whether or not this is the case may be ascertained by putting a drop of iron chlorid solution on one surface, allowing it to remain for a short time, and then absorbing the surplus liquid with filter paper. A drop of tannic acid solution should be placed in the same position on the other surface of the paper. If the paper is badly calendered a black spot will be noticeable. Badly calendered paper readily absorbs moisture and forms an excellent medium for the growth of micro-organisms.

Left-over Foods and How to Use Them. Elizabeth O. Hiller. Kendallville, Ind. McCray Refrigerator Co., 1910, pp. 32, pl. 1, figs. 15.

The marketing, selection, care of foods, and similar general matters are discussed and a considerable number of recipes are given for the use of left-over foods. Sections giving clear and concise directions for the care of the refrigerator constitute an important feature of the publication.

Feeding the School Children. Jeanette van Ruypen. *Cooking Club Mag.*, 12 (1910), No. 6, pp. 63, 64.

Information is summarized regarding the efforts which have been made in a number of cities to supply meals to needy school children, and the importance of such work is discussed.

Rate of Wages and Cost of Living in Yarmouth. A. J. Fleming. *Weekly Cons. and Trade Rpts.* U. S. 1 (1910), No. 3, p. 102.

Data regarding rates of wages, cost of food, and other necessities in Yarmouth, Nova Scotia, are summarized.

Wages and Cost of Living in Great Britain. H. Studniczka. *Weekly Cons. and Trade Rpts.* U. S. 1 (1910), No. 3, pp. 97-102.

Data regarding the prices of food, the average cost of living in workingmen's families, and similar information are summarized.

Quarterly and Yearly Averages of Prices of Provisions during the Year 1908. W. P. Chapman. *Diplo. and Cons. Rpts.* London. Ann. Ser., 1908, No. 4401, p. 32.

Data are summarized in tabular form regarding the prices of foodstuffs in Florence.

City Bakeries. C. Aronovici. *Survey*, 23 (1910), No. 15, pp. 497-499, figs. 4.

The author briefly reports the results of a study of the condition of bakeries in Providence, R. I. Of 106 bakeries examined, 4 were classified as very clean, 21

as clean, 40 as tolerably clean, 33 as filthy, and 8 as very filthy. "These figures show that only one-fifth of the shops could be classed as clean."

Night Work in Bakeries. F. Lösser. *Soz. Praxis*, 19 (1910), No. 31, pp. 818-820.

The author discusses the need for forbidding night labor in German bakeries, and points out what has been accomplished in other countries.

Regulating Night Work in Swiss Bakeries by Legislative Enactment E. Platzhoff, Jr. *Soz. Praxis*, 19 (1910), No. 31, pp. 820-823.

The need for limiting night work in bakeries is pointed out, and what has been accomplished in Switzerland discussed.

The Housing Conditions of Employees in Hotels in Hamburg. *Soz. Praxis*, 19 (1910), No. 24, pp. 940, 941.

A report of an extended study from a hygienic standpoint of the housing conditions of hotel employees, made under the provisions of local legislative enactments. Ventilation, light, air, and other similar factors were taken into account,

The Removal of Odors Through Ventilation. Kisskalt. *Arch. Hyg.*, 71 (1909), No. 4, pp. 380-386.

In a contribution from the Hygienic Institute of Berlin, Dr. Kisskalt reports that the various distinct odors clinging to prisons, institutions, schools, old dwellings, old clothes, etc., appear to be due to absorbed substances of unknown composition which emit these odors for many months or even years. Good ventilation banishes them temporarily but they return when the rooms are closed.

A test made with ammonia gas in a closed room proved that six weeks was not sufficient to remove the whole amount that had been absorbed. Moist materials, e.g., clothing, utensils, etc., in a damp room, will absorb more of such odors than dry.

This investigation points to the value of smooth, non-absorbent surfaces and to the use of paint and varnish as renovators.

Cleaning and Renovating at Home. E. G. Osman. Chicago. McClurg. 1910, pp 193. 75 cts.

A considerable amount of data are summarized regarding cleaning materials, cleaning processes, etc., and directions are given for cleaning and renovating clothing and other materials. The work is designed as a household manual.

How Shall the Little Ones Sew? Florence Kendrick Johnson. The People's University Extension Society, 105 East 17th St., New York City. Pp. 32. Price 10 cts. (institutions and charitable classes, 5 cents, postpaid 6 cents).

This little book promises to be an excellent guide to those conducting sewing classes in settlements or church schools. It is an outgrowth of the work done under the Peoples University Extension Society and is the result of study and

investigation made in this particular field of sewing for children. It emphasizes especially the capabilities of young children and the dire results which come from overtaxing the nervous system or straining the eyesight by fine sewing. It is a simple, practical book with an illustrated course of study outlined for one year. The author also offers suggestions for other courses to follow, but wisely refrains from making the plans too definite. She rather advises that they should be the result of the needs and peculiar conditions of each class. The two systems of fine and coarse sewing for young children are contrasted and the fact demonstrated that the old-time fine sewing on scraps is detrimental to the health and interests of the young child. The book is an excellent beginning in an important line of work.—ANNA M. COOLEY, Teachers College.

House Decoration. Dorothy Tuke Priestman. Philadelphia. Pennsylvania Publishing Co., 1909, pp. 208. \$1.00.

The treatment of walls, the selection of furniture and floor coverings, the kitchen, the bathroom, home carpentry, and other related topics are taken up in this volume, which as a whole is a useful handbook for the general reader.

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EDITORIALS.

Institution Problems and the Household. Groups living together under one roof are growing larger and larger, and the problems of satisfactorily administering the affairs of the larger family are becoming more and more complex. As wants increase in variety, the cost of living increases and economy in the conduct of affairs becomes a pressing necessity. Coöperation is taking the form of community living rather than coöperative family housekeeping, which seems to have failed on trial.

These conditions bring to the front not only financial questions, but also social and psychic problems which must be really studied. The merely mechanical details of community living are not more difficult than many others which have been successfully worked out in other kinds of business and manufacture. Like all inventions the difficulties are in the first stage of trial. But in household management there are two new factors. First are the individualistic preferences which have been fostered by the private life of the family, and which disturb the large home rather than add to its attractiveness. Coöperation, the union of individual efforts for the common good of the whole community, is not understood—wilfully disregarded, no doubt. The recognition that coöperation must be based on a common law or principle, while individualism is lawless and whimsical, will mean a long step towards a solution of the living problem.

The second factor in obstruction is the lack of team-work—one might say the rebellion against it of the household manager and worker. Women want their own way, whether it is a good way or not. Their province is the last stronghold of traditionalism. They have been slow to see the advantage of scientific ways and inventions,

and they are adopting them only under the compulsion of circumstances. In this negligence, women may perhaps be said to be only negatively at fault. The social condition is the positive reason, and the housekeepers will not give up their inherited views. Why? Because they cannot see the new way without much work, much thought and much readjustment. They are, in truth, lazy.

If housewives are to have anything to say about the habits and customs of living which the middle of the twentieth century will see established, they must bestir themselves. It is necessary for them to grasp some of the business principles underlying the living conditions of large groups before they can bring any modification into the mechanical tendency of the single home.

For this reason women are urged to undertake the study of the existing groups—school and college dormitories, summer hotels, apartment houses, cafés, tea rooms and restaurants, to see wherein fundamental assumptions may be amended before they become settled habits expressed in brick and stone and therefore difficult to change.

It is necessary to study the social and psychic conditions in order to establish these principles. Therefore at present the discussions must be largely pragmatic and argumentative, though never dogmatic.

The recent Lake Placid meeting marks the beginning of a new era, and as such is worthy of more attention than even the individual papers warrant.

ELLEN H. RICHARDS.

The problems of institutional management are growing apace in this country. Whether these problems concern the well-being of the child in orphan asylum and boarding school, the youth in college dormitory and factory boarding house, the traveling public in hotels, the sick in hospitals or the inmates of prisons and reformatories, they can be met only by such a consultation of experts as took place at Lake Placid in July last. Superintendents, matrons, purveyors, nurses, social workers, will all find the papers presented, and which appear in this number of the *JOURNAL*, both valuable in the subject-matter presented and suggestive as to future work along these lines,

It has been asked what lesson have these papers for the householder, she who presides over a very small group? For the household whose income is certain and adequate for the scale of living that

has been adopted, direct help and very valuable suggestion will be found in these papers. System, order, accurate accounting so that we may know an economy when we see it are greatly needed in the average household. If the care of dormitory bedrooms can be standardized, so also can the care of home bedrooms. And yet we must look with tolerance on individual needs and consider the complexity of the housekeeper's problem. Homes are established without a board of trustees, without a permanent bank account, without a settled policy as to the relative importance between a balanced ration and a Sunday gown for the mother; and their relation to the general good or to commonly accepted standards is in many cases slowly learned by the pressure of outside forces. The proportion of the income available for housekeeping is often too variable, too much influenced by the various tastes and preferences of the different members of the family to admit of applying to it the standards of hotel and hospital. To eke out the sum needed for the son's or daughter's college course, the store of household linen may be allowed to run low until the end of the four years, the house denied its rightful coat of paint, and the family compelled to "put up" with a far from perfect bathroom, and who shall say that a mistake has been made? We all know that the apportionment of the household income after the primal needs are met touches important questions of ethics as well as economics, and may be called the keynote of the social and moral status of any given family, of whose many functions, let us remember, housekeeping is but one. The problem of the institution is far simpler in that it is much more confined to housekeeping alone.

But the small householder, although debarred from direct imitation of the methods employed in hospital and hotel, has warrant for a growing interest in the usages of large institutions and ways of meeting their problems. For instance, by observing hospital methods she may be convinced that it is perhaps impossible to carry through in her own house a case of contagious disease without danger to the rest of her family, and she will realize that the hospital will more and more be the resource in such emergencies; if it is proved to her that the hotel and restaurant are well-kept, she will more and more use them for the occasional dinner when light housekeeping palls; more and more insistent already is heard her demand for food depots where cooked food above reproach from a sanitary point of view, and yet of reasonable price, can be obtained for consumption at home, such food as the New England Kitchen furnished in Boston.

The small householder also increasingly needs the help of the laundry and bakery, the fine equipment and wholesale methods of which, she realizes, should enable them to put the home wash tub and range oven out of business. But both of these industries are yet to be brought under proper inspection; the laundry as to unhygienic methods, the use of destructive chemicals and combined action to keep up unnecessarily high prices (it has been shown in at least one city that the price for flat work can be placed far below twenty-five cents a dozen); the bakery chiefly as to its cleanliness and the quality of its product, for it remains a fact that the German baker who produces in Germany a loaf which no housewife can equal, bakes bread in his adopted land of such a sawdusty flavor and consistency that the housewife with any standards as to what this staff of life should be is forced to make bread in her own kitchen, where she reaches better results with good materials combined with only average skill. It would seem that we are to gain better inspection and control of these industries only by going outside and fighting for it as we did for the honest label on can and package, which when obtained gave new value to the products of cannery and packing house.

This is our greatest interest in the large organization. It must serve us honestly, effectively and cheaply, and thus take out of the house the heaviest tasks, and those for which it is not equipped. And to what end? Not that the house mother shall be freed of duties owed her family, but that the amount of house work may be so reduced that she can in most cases handle what is left with ease and without the presence of a servant, thus enabling her to make of the house work an invaluable teaching plant for the children of the family, something she cannot do if the work is so heavy as to exhaust her and take all her time, or if an outsider, cook, or other helper is present.

We do not appreciate as yet the value of the household arts in the education of young children who help the mother in performing them in an unhurried way and with the best appliances. And to this must be added the cultivation of the home garden plot, for, if we may judge by the opinions and projects of the farsighted men and women who are giving their time and energy to social service, the child of the future is to be brought up in the country or city suburbs and in small groups which shall bear a vital relation to one woman, the mother, either real or adopted. Scattered groups of this kind are not to be helped by any plans for community living.

Is not this relief of the household by the better organization of outside business for doing some of its heaviest tasks the next great work to be attacked?

MARY HINMAN ABEL.

**Standardization
of Housework.**

To standardize housework, as business has already been standardized, is one of the tasks for the near future. If you should ask twenty housekeepers how many maids would be required to care for two hundred bed-rooms under stated conditions, possibly two or three of the answers might agree. Probably none would do so. The manager of a laundry can tell you how many shirts an average ironer can put through in a day. The factory foreman knows the exact output of each department for any given time. Yet in work no less important we are still groping uncertainly. A few investigations have been made, but they are a mere beginning. In dining room service there is more nearly an agreement as to what one person can do than in other departments of housekeeping. During the past year at Teachers College a student has taken for her research work a comparison of chamberwork in five college dormitories of different institutions, making careful time studies in each case. We need very many more such studies—hundreds of observations, in fact, from which to take averages. All kinds of institutions and all kinds of domestic tasks should be studied, so that any inquirer in any phase of the work may be able to gain reliable information suited to his particular needs.

**Study of
Finance.**

A young woman in New York was recently asked if she would consider a position as head of a lunch room. She answered: "I shall not know till I have heard just how much money you will allow me to spend for maintaining that standard for meals which, you say, you insist upon."

The good sense of this reply is obvious, yet how many managers, either of private homes or of institutions, can tell accurately in advance (barring the fluctuations of the market) how far a definite sum of money will go toward feeding and housing people under certain conditions. We need more study—careful, painstaking study—of the value of a dollar. The training schools can and must help us by requiring courses in business management of all those who seek the

responsibility of spending other peoples' money. Institution managers can help us by keeping their records of expenditure in such thoughtful and intelligent form as to be, when called for, a valuable contribution on this subject. The home makers can help us by keeping strict and classified household accounts, and directing their children in the same paths. The most insistent complaints of poor food and poor service throughout a building, come, as a rule, from those who have had the least experience in domestic affairs, large or small, and who have never learned how much and how little a dollar will buy.

Household Pests.

Practical sanitation in crowded centers offers a field for the most zealous work. Much has been written, and well written, on the subject of household pests, yet the last word has still to be spoken. New York City, as is well known, is infested with vermin, and large institutions situated therein are constantly asking each other how to fight this great enemy of cleanliness. Many of the agents recommended contain combustible materials prohibited by insurance companies. Other remedies are dangerous to human life. Still other "sure cures" have odors which make their use practically impossible in buildings containing hundreds of inmates. The problem which faces administrators of hospitals, dormitories, etc., in crowded cities is appalling. May not some of the study of the near future be directed in this channel?

Institution Government.

Much is said, nowadays, about standards in all our institution work. We have yet to come to an agreement as to the simplest, sanest form of government. The names "superintendent," "housekeeper," "matron," etc., are still rather vague terms. Responsibility without authority is preventing good work in many quarters. Will not the American Home Economics Association help the institutions to some uniformity in these matters? Probably hospitals are the most nearly agreed, but in other institutions an amazing variety of interpretations prevail. Definiteness and consistency as to the duties, rank and practical authority belonging with each title would give, we believe, new dignity to the worker, and through closer organization, an improvement in the quality of work.

GENERAL PROBLEMS IN ADMINISTRATIVE WORK.¹

ADELAIDE NUTTING,

*Teachers College, New York City.
Chairman of Session.*

Miss Nutting opened the meeting by a brief presentation of the field of administration, showing the developments which have taken place in recent years in institution life, the new avenues of administrative work which have thus been opened up, and pointing out the tendency of the day toward specialization, through which further similar developments might be looked for. The hospital was referred to as a prominent type of institution, in which the growth both in numbers and variety had been especially striking, the number rising from about one hundred twenty-five years ago to over six thousand as recorded to-day, and the variety such as to call for an extensive classification, both as to form of government—such as state, municipal and private—and kind of work—such as that called for in emergency work, childrens', psychopathic, tuberculosis, etc.

The increase in the number of college dormitories was also noted, and mention was made of clubs and settlements, and of the commercial field of administrative work as seen in hotels, apartment houses, restaurants and lunchrooms. The same problems, varying only in dimensions and intensity, were shown to be common to all, each calling for highly organized, highly skilled housekeeping, and for the educated administrator.

Referring again to the hospital, Miss Nutting pointed out the steady advance in knowledge of foods and nutrition, of the continuous investigations and experiments made in this subject, and of the modern hospital as the center of much of study and experiment, as well as of the practical application of new discoveries, theories and methods.

¹ The following papers, with the accompanying discussion, were presented at the Lake Placid Conference of the Administration Section of the American Home Economics Association, June 27 to July 1, 1910. A program of the conference is given on page 583 of this number.

To make such practical application of scientific knowledge, it became necessary to create the dietitian.

As typical of some of the specialized fields of work, a brief review was made of the duties of the dietitian in the modern hospital, as follows:

"In almost all hospitals, the dietitian will be called upon to arrange for at least five types of dietaries, and suitable variations must be made within each type, the governing factor often being the per capita cost per day, which may range from eleven cents to forty or fifty cents. There is first the daily dietary for the non-paying patient in which the maximum of nourishment must be secured for the minimum cost. On the other hand there is also the dietary of the private wards, which is in essence that of a hotel where not only the very sick must be cared for, but also where convalescents in various stages call for much thought. The choice and combination of foods and their preparation and service must be well-nigh faultless if they are to satisfy people accustomed to such standards in their own homes, and unwilling to accept less in sickness, elsewhere. The special diet of individual patients is often their sole treatment. Any diet is apt to grow monotonous, whereas a new dish may cause as much excitement as Halley's comet. The recovery of the patient sometimes rests upon the skill, fidelity and judgment with which a prescribed diet is administered, and while the nurse may be the direct agent, the quality of food and its selection are not usually within her province, but rest frequently with the dietitian, who is usually also responsible for its preparation.

"The dietary of the students in the training school, upon whom in the last analysis the burden of the hospital work rests, should also be a matter of constant thought and attention. It may be simple, but it should be extremely nourishing, well cooked and well served, and I believe that unwise economy in this department is detrimental—highly so—to the best interests of the entire institution.

"In addition to the body of student nurses there will be a staff of residents, whose work is important and arduous. The same need exists for a generous dietary for them, but I lay less emphasis upon it here, because there is usually less difficulty in securing suitable food for the physicians than for the student nurses. Finally comes a group of employees of varying types, men and women, whose work is essential to the efficiency of the institution, and whose needs in the way of daily food are obvious.

"The dietitian in such a field has problems of very grave importance, and careful scientific, technical, and practical training is required in a modern hospital to handle the situation efficiently. It would be almost as useless a task to attempt to train a nurse by theoretical methods and expect her to understand and handle efficiently the varying problems of illness, as to expect a woman trained only in the laboratory and class room to direct successfully so important and complicated a field of practical work. One woman may pay the highest prices and select the best foods, but lack business knowledge and be blind to spattered windows, sticky and soiled cruets, and dirty floors. Another may have knowledge of foods but fail entirely in handling employees. There is a clear-cut, definite demand that dietitians shall be trained women, not relying solely on the telephone but knowing conditions, markets, prices and quality. Before we can produce the right women, there must be a well worked out, practical system. To discuss the essentials of such a system of education for the various grades of institution workers is one of the purposes of this Conference.

"It seems evident that a dietitian should have a good working knowledge of physiology as well as of chemistry and physics, and there should be no uncertainty about the matter of bacteriology, since sanitary precautions need nowhere to be more scrupulously observed than in the handling of food materials, their storage, preservation and preparation. After the dietitian has had good scientific groundwork and applied science in the laboratory, she must seek some contact with the actual problem of selecting, buying and combining foods, with seeing that they are properly cooked and served three times a day, and with meeting the emergencies that may arise in the purchase, preparation and serving of such meals. Work of this nature should be done by the student under supervision and direction, and not until she has demonstrated her power to plan and carry out to the last detail the work involved in her department and her ability to meet its ordinary responsibilities, should she present herself to the hospital as ready and competent to assume control of one of its most important departments."

Following this survey of the field of the dietitian as fairly representative of the more specialized branches of administrative work, the matter of nomenclature was brought forward. A serious study of this point was urged, in order that the province and duties of the various grades of institution workers might be carefully defined, and

appropriate titles instituted where now non-existent. Confusion as to the functions of house director, matron, housekeeper, or of dietitian, purveyor, steward, could only be removed by such exact and careful defining, which would be of great assistance in planning suitable courses of study for the preparation of such workers. The English term manageress, the French *econome*, and Mrs. Richards' suggested refectioner or refector, were discussed, and the advisability of appointing small committees to agree upon nomenclature as well as courses of study was urged. It was further pointed out that while commercial rewards are fair in the administrative field of work, its intrinsic importance in the community is the point at issue, and one which must be constantly emphasized.

Certain Phases of Instruction in Institutional Management.

SARAH LOUISE ARNOLD.

Dean of Simmons College.

This paper does not attempt to deal with the intimate problems of institutional administration, which belong to the expert. It is presented rather from the point of view of one who has necessarily dealt with organization for instruction, has considered the problems as suggested by the demand for workers and the reports from the field, and who has viewed the subject chiefly as an extension of the original field of Household Economics.

It is evident that there is an urgent demand for women of native ability, mature experience, social aptitude, good judgment, promptness in meeting emergencies, and sound business sense, to direct institutional housekeeping, if so awkward a phrase may be allowed. It is clear that many of these qualities must be contributed by the individual. They cannot be secured by a fixed course of study in school or college. On the other hand, they may be developed by wise tuition. And, further, opportunities may be provided for such observation, such practice under expert guidance, such interpretation of accumulated experience, as will fortify the worker and prevent her from making the mistakes of the novice.

This, I take it, has been the purpose of the various courses in institutional management which have been hitherto provided. No course has been supposed to be complete. Its virtue has depended chiefly

upon its suggestiveness, its provision of opportunities for observation and practice, and the semi-professional attitude which has been developed by association in the study of a common vocation. What we have to say, therefore, cannot be at all in the nature of a last word on the subject. We are all groping towards the light, but there are already many signs of the coming day.

The experiments in training for institutional administration which have been carried on at Simmons College for the past six years have naturally been closely connected with the evolution of the management of a city dormitory on the one hand and the development of courses in the school of Household Economics on the other. It seemed reasonable to establish a course in institutional management under the leadership of the house superintendent, whose ability and judgment in practical administration provided a natural reservoir of immediate instruction. A small group of mature students was therefore gathered under her direction, with the understanding that at least one half of the time should be given to the study of related subjects at the college, and the other half to observation and practice in the college dormitories, united with visits to institutions and abundant opportunity for marketing. With the college authorities approving the experiment, it was possible to make use of the dormitory as a training school, with the daily affairs of dormitory administration as a text for instruction. The problems connected with such use of a college residence will be discussed later. It was clear, however, that the laboratory was the essential element in such instruction, and the college gave every opportunity for such practice, as the demands arose.

Miss Colburn, who carried the first years of this course, brought great enthusiasm and unfailing devotion to the work. Her broad experience and her professional spirit gave both breadth and intensity to her teaching. With every year, therefore, the course was strengthened. On the withdrawal of Miss Colburn the instruction was continued by Mrs. Weld, who came from successful experience in hospital administration. The college lunch room was added to her domain and arrangements were made with the Women's Educational and Industrial Union for the provision of additional practice under business conditions. The demand for graduates from this course always exceeds the supply, and the number of registrations indicates that the necessity of preparation for institutional administration is recognized as never before.

Certain principles may be fairly deduced from even so brief an experience. Of these I have selected certain essentials for further discussion.

First, the principles of institutional housekeeping have much in common with the administration of the private home, and the student may with profit follow ordinary courses in Household Economics as a foundation. The common fundamental knowledge having been secured either through college courses or earlier preparation and practice, the emphasis of specific courses in these subjects should be chiefly placed upon phases which are apparent only in institutional life. For example, a perusal of the columns of "discoveries" in a magazine devoted to the interests of the household shows clearly that devices which are useful to the individual will not serve in the hands of a changing body of paid servants. The equipment of a hotel kitchen must take into account carelessness in handling utensils, the rapidity of service, and congestion at times of greatest pressure, all of which increase the probabilities of breakage. The equipment then, must either be frequently renewed or must be fitted to withstand the usage attending these conditions. The exquisite china, which is delightful to contemplate on the home table and which is handed down from generation to generation by the careful housewife, naturally disappears from dormitory, hotel or club, except where cost of residence is made to include cost of breakage and the desire for the beautiful and attractive is met by the increased amount paid for care, for labor, and for renewal of material. The institutional question, therefore, is not simply what equipment is immediately attractive and supposedly serviceable but what equipment will meet the demands of this particular institution with the utmost satisfaction and the least expense.

Or again, the menus provided for the private family, which are not only orthodox as to dietary, but toothsome and aesthetically attractive, are often costly in expenditure of time. Such expenditure is not ordinarily estimated in the private family, as it is freely given out of the time and thought of the *home-maker*, who gives everything for the sake of those whom she serves. The institution, on the other hand, must pay for all such provision, and it requires a wise head to apply the household experience in a manner which will secure attractiveness and efficiency with the least expenditure in labor, in time, and in money. Many things, therefore, which are *encouraged* in the housewife must be *discouraged* in the institution if it is to be an economic success.

These illustrations may suffice to indicate the truth that it is well for the candidate in institutional management to bring to her course a full knowledge of individual housekeeping and the principles involved therein, in order that she may give the time of her institutional course chiefly to the practices in which the institution must differ from the home.

It follows that general courses in household arts,—cooking, sewing, cleaning, etc., ought not to be an essential feature of the instruction in institutional management. The student who is properly prepared will bring this knowledge with her. Thus far, however, it has been necessary to give this elementary instruction to many of the candidates—and here has been one of the difficulties of the course. Later we may be able to require either assurance of such preparation before entrance, or a prolongation of the course if such elementary instruction must be included.

The course of instruction should include general principles and the application of these principles in specific cases. Sanitation presents a fair illustration of this requirement. The student can hardly know too much of fundamental science in order to be intelligent as to sanitation. On the other hand, her general knowledge will not suffice unless her attention is directed to specific applications as required in the hospital, in the dormitory in quarantine, in drainage and plumbing problems, and in the attention to food supply. Wise expenditure will not be assured until the student sees all her supplies in relation to the essential needs of the family. In the application of such principles she may balance mosquito netting over against a dainty meringue and decide in favor of the homely but more essential expenditure. There will be no question of administration which is not fastened in some way to such fundamental principles of science or economics.

Here again, then, it becomes evident that the student who is best prepared for her work will bring training in science. To this should be added economics, with some understanding of social problems, and a thorough course in principles of business administration as applied to housekeeping. The first two of these may be secured through intelligent reading, if the student is sufficiently thoughtful and mature. The last-named is not yet "written in the books," so far as housekeeping is concerned. It is probable that no such course will be outlined until some intelligent housekeeper with business ability joins hands with an intelligent accountant who has suffered

from the defects of his own housekeeping. Through the common effort of authors thus equipped we may be supplied with an adequate course in the study of institutional expenses.

This course, for which we all are waiting, should be something more than elementary bookkeeping and accounting. To record in figures amounts received and paid out is a matter of elementary equipment. To be able to study institutional administration, judging clearly as to essentials and non-essentials, cause and effect, values in money, in time, and in labor, the unavoidable wear and tear accompanying everyday use of equipment, the accumulated losses through inconvenience and unsuitable material, the accumulated gains through economical investments and suitable care,—all these and a hundred other kindred matters belong to such a study of institutional life.

It is not likely that many instructors can at the moment be found prepared to map out such a course. Neither is it probable that the young student, unfamiliar with responsibility in expenditure, would understand such topics however skillfully presented. It seems clear that the woman who is to succeed in such administration should have some practice in business affairs in a field where the dollar is given only for value received. The administration of a hospital or dormitory, where the income is supplied without personal responsibility, does not present clearly all sides of this problem. Actual apprenticeship in some specific business would prove of great value to the candidate in institutional management. Perhaps no experiment in the course provided by Simmons College has been more valuable than that which has connected instruction in institutional management with the opportunities offered by the Women's Educational and Industrial Union and the New England Kitchen, which provides luncheons for the high schools of the city of Boston. In the ordinary public lunch-room one must meet the public demand, varying with weather, with holidays, with the procession in the neighboring street, or the accident which blocks the cars. One must learn to make ends meet and to confront emergencies with composure. The school luncheon must be served, wholesome, ample, hot or cold as the weather may dictate, on the exact moment, with lightning speed and unvarying precision. The art of giving much for little must be studied and the demands of the boy-and-girl public carefully considered. All the while the canons of nutrition must not be disobeyed, though the clamoring buyers demand hot doughnuts and pink ice cream.

Such training ought to develop business ability and a clear conception

of a genuine demand. It goes without saying that the student derives value from the experience proportional to the amount of previous experience which she herself is able to supply. The complete course of instruction then, should secure the following:

(1) Understanding of general principles in science, economics and social service.

(2) Knowledge of the principles of business expenditure and general administration.

(3) The application of these principles to the art of housekeeping in specific institutions. This will necessitate (a) observation and practice under guidance in some institution; (b) interpretation of the observation of institutional life; and (c) interpretation and discussion of the practice.

A single year will not suffice for such a course, particularly if elementary instruction must be added to make good deficiencies in preparation. It might be well to require apprenticeship in an institution either between the courses of instruction, or in the midst of such a course. If the students were to enter in September, study, observe, and practice until June, take temporary positions for the summer, and return for a three or four months' course in college after vacation, the value of the present year's course would be more than doubled.

A valuable element in any course in administration are the reports from the field. Such reports may be made by masters of the art or by the beginner, in whose mind the immediate difficulties loom large. Anything which fastens the attention of the student upon the actual problems of the work and forces her to look for remedies in her study, will give point and life to the work. Frequent discussion of letters asking for workers and enumerating the responsibilities attending positions will reinforce the instruction in a vital manner.

Reference has been made to the difficulties attending the use of a college dormitory as a laboratory for practice. This difficulty is two-fold. In the first place, an intimate study of details of administration, with the natural balance of pros and cons with reference to expenditures desired or prohibited, cannot in the nature of things be made by students and discussed by the resident student body with perfect understanding. The range of expenditure never comes within reach of the ordinary undergraduate, who has not yet learned how to measure income and outgo and who rarely keeps even a personal cash account. That the institution should not provide all the perquisites of the home, including the work basket, express fees, and gratuitous

service is naturally incomprehensible to the freshman, and is not always clear to the senior. It is not to the advantage of any institution to have all the details of expenditure publicly discussed by groups who are not familiar with the aggregate cost of maintaining a large plant all the year around, with the expense attendant upon depreciation, accident, or problems in administration. It is therefore a very heroic person who reveals the pages of the daybook to the students of institutional life who are present in the midst of the family. This in itself creates a delicate problem in institutional practice.

Relations with servants may likewise hinder the desired practice on the part of the student. The apprentice of the moment must learn from cook or maid, or at least must stand beside her, and the duties of the latter are likely to be much increased by the fleeting procession of novices, experimenting with soups and doughs. While this may be skillfully managed, it is costly in every way. The fact that a small group must be admitted at one time lengthens the procession and to the servant the completion of the immediate day's task is dominant. Dinner must be served for the family at the appointed hour with ordinary procedure and emergencies met as best they may at a moment's notice. The presence of the would-be helper may therefore, be an encumbrance. On the other hand, to the instructor, the evolution of the pupil is the essential aim and the dinner is secondary. One needs all the wisdom of the ages to deal wisely with human nature under these conditions. We all know that under present conditions of domestic service, the problem just suggested is not a small one. It is a pleasure to record the genuine interest which has been expressed by the employees at the college under discussion, who have coöperated to the utmost in the experiment now being reported. Nevertheless, the problem is evident, and fairness to both sides requires a careful study of the situation. It is clear that the difficulty would be much increased if the superintendent in charge of the housekeeping were not the instructor in institutional management. This double appointment secures unity, and, through full knowledge of both sides of the question, prevents arbitrary enactments.

Further, the dormitory should be first of all a suitable residence for the student, where as far as possible privacy and personal ownership should be assured. The room having once been rented to the occupant, the question of invasion by persons not authorized and perhaps not desired is a serious one. Therefore practice in household arts

or inspection of the room by members of a class may be unwelcome. If so, the enforcement of the practice is a delicate question. No matter how tactful and discreet the practicing students may be, there is room for possible comment which the individual may deprecate or even dread. While this matter may be fairly well managed with a small group in a small dormitory, the difficulties increase with the size in the family and the number for whom practice must be afforded. It is probable that few colleges will permit this form of observation and practice. The general apprenticeship which affords such an opportunity because service is paid for will undoubtedly take the place of the general practice in school or college houses of residence.

Ideals in the Administration of the College Dormitory.

MARION LINCOLN CHAMBERLAIN.

Dean of Women, Rhode Island College.

We all have ideals of what a college dormitory should be and some of us have been so fortunate as to preside over the erection of new buildings and to see our ideals become concrete and alas! not altogether faultless realities. But we Americans are already outgrowing the fetish worship of the 'up-to-date' and are coming to realize the value of that picturesqueness which time and the wealth of association alone can give.

The young women at present under my charge find themselves in a building twenty years old, with the outward charm of an old French château and with not a few of its inconveniences. Their social life centers in a great hall going up through two stories with a gallery around and light from above, a distinctly dignified and beautiful apartment. Here are piano, couch, lounging chairs, etc., and pictures, as many as can be hung without crowding. Such an apartment is ideal for any dormitory. An open fireplace, where a fire is kept whenever the weather permits, is a necessity, the gallery appeals to the romantic age and the pictures have marked effect.

Many dormitories present a choice between a single separate room and rooms shared or rooms in suites, where each girl has a separate bedroom and a share of a common study. Each student should care for her own room. Here is her first chance to practice the application of her lectures in hygiene, euthenics, and household management.

When the room which in the beginning of the year was furnished with a Japanese parasol suspended from the ceiling, from which hung fifty-nine small parasols, all in constant double revolution, with each window defiled by an abomination of tinkling glass, the walls completely obscured by multitudinous and slovenly posters, a hammock swung full across the entrance door, and a couch swarming with pillows, when this room gradually emerges as a restrained and comfortable apartment, then we feel that the seed is taking root.

At some schools the general work of the dormitory is done by students who thus earn their expenses. The organization and oversight of these student janitors is no light matter. As far as possible they should be drawn from students of Home Economics, and the aim should be to train them to regard this work from the laboratory viewpoint. Each one should have her own field and her own ample equipment; then the general labor-saving devices, such as the vacuum cleaner, etc., must be used with careful coöperation. These girls should acquire a sense of the necessary continuity of effort, should learn that the point is less to *make* clean than to *keep* clean, should really know cleanness when they see it, and should be able to attain it by the best modern methods. They should realize the dignity and justification of labor, and they ought to acquire a real mastery over their environment.

Dormitory life stands to most of the inmates as their first experience in community living. The home conditions from which students come are various and go far towards explaining their outlook on life. A friend in charge of a small dormitory allows me to use the following results of an investigation of the students under her charge: Parents living together, the mother not a wage earner, the student is the only child, 10 per cent; one parent dead, 30 per cent; parents separated, 20 per cent; father living but the mother supports the family, 20 per cent; normal homes, *i.e.*, the parents living together, the father supports the family, the student has sister or brother, 20 per cent.

The "only child," the headstrong and impulsive girl whose only knowledge of a mother is a step-mother from whom she is deeply estranged, the girl who scorns her father and is ashamed of her home, or the girl who has earned her own living since she was fifteen and is selfish and suspicious, to each of these the dormitory, with its equitable and orderly life, must speak in her own language. If her life heretofore has been without natural guidance and control, here she comes under just and patient rule typical of the justice and protection

which the state exercises over each of us. If she has come up selfish, overbearing, and self-centered, here in a community of her equals she realizes her debt to society and the joy of paying it. Where the work of the dormitory is done by student help it is easier to train the other students to be just and thoughtful than it is where they depend on paid servants. The student thinks twice before imposing on a class-mate who is her superior in all but worldly riches, and she is brought sharply to time for making unnecessary work.

While life in common rubs off corners, and develops coöperation and companionship, forbearance, and the art of living together, its most important function is to awaken the student to the sense of her own inner life, so that she will develop her own personality, to teach her self-control and self-reliance. It is told of Lady Dilke, the original of Dorothea in *Middlemarch*, that when she was living as a poor young student in London, she and a friend were obliged to share a room. By mutual consent they drew a chalk line across the floor from the middle of the entrance door and neither one infringed on the other's privacy. Many American girls need a touch of this spirit. One girl, who confessed that at home she took her naps on the dining table rather than go into another room and be alone, after three years at school, during which she had gone through the stages of room-mate and study shared with another, at last came of her own accord and asked for an entirely separate room, saying that she thought she could study and attend to her work better if she were by herself and that she was willing to forego her share of a study in order that she might be alone—thus showing that she had attained her spiritual majority. Twins who have always roomed together often decide after six months at college that each one would prefer to have her own bedroom.

I consider a separate bedroom an absolute necessity for the best results; studies are better shared and entertaining is best done in common.

In a co-educational institution the question of entertaining becomes a crucial one and it seems only fair to both the young men and the young women that the latter should be reasonably encouraged to play the rôle of hostesses, a rôle they dearly love and through which much valuable training can be given. The following is a reasonable régime: On four or five evenings of the week regular study hours are kept and quiet is maintained. On one or two evenings visits may be paid, entertainments given and callers may be received in the studies and the common room. The study doors must, of course, be open and

the young women are encouraged to club together in their social enterprises. The degree of conventionality to be sought in their social life is a nice question and must follow somewhat the tone of the community in which the college stands if the students are to escape unjust criticism. But the standards should be based on courtesy, fairness, and frank recognition of truth rather than on outworn conventions. Above all else the tone should be democratic, social equality being the keynote of the college life. I think that girls are natural democrats and if they are well handled through their sports and their home life in college they may be given a very strong bent in the right direction.

Dormitory Life for College Women.¹

MARION TALBOT, LL.D.

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The usual conception of the college dormitory is so mechanical and its administration so frequently thought to be a matter of rules and restrictions that it is small wonder if, when a new woman student is asked if she intends to live in a university hall, she replies, "Oh, no, I shouldn't think of living in the dormitory. I have had enough of discipline and herds of women, and must live with greater regard to my own personal needs."

The problem of the dormitory contains many more features touching on the inner life of students than the architect, the financier, or even the administrator ordinarily recognizes. The very use of the term "dormitory" shows how little conception college authorities have of the real function of a building in which the student is to receive some of the most profound and lasting impressions of her whole college life. It may be for sleep, it may be for shelter, but it has many other needs to meet, and it should be adapted to those other needs also, and the activities which go on in it should be such as will enrich the nature and develop the character of those who live within its walls, as well as correlate the discipline of the class-room with the demands of life. The framework of the body is of importance only as it serves for the expression of the spirit that occupies it.

¹ The original paper was written for the *Journal of the Religious Education Association*, April, 1909.

For the greater part of four years the college hall furnishes to the woman student nearly all that she has of home life. These college years are precious years in a woman's life. Quite as much as previous years, they serve to establish standards of conduct, of principle, of social efficiency, of appreciation, of discrimination, of moral power, and, because the family and the home are the most effective agents in these forms of education, it is essential that the college hall, in which the woman student spends a large part of her time, should be organized as much as possible like the family and the home.

Side by side with the present-day questionings concerning the effects of modern conditions on the home and the family, there is a deepening realization that the fundamental principles of these institutions are essential for the well-being of the individual and of society and that their permanence will depend very largely on the position of women and the attitude of women toward them. For the sake, then, of the home and the family, those features of social and domestic activity which characterize institutional life must be reduced to a minimum in the college residence, even though it may be impossible to eliminate them all. The student during these college years should be kept under influences which will later make her shrink from those aspects of organized living which involve the sacrifice of the real functions of the home. The boarding-house and the hotel, the rented furnished house, and the yearly moving do not furnish proper means of expression for those principles which characterize the family, and the college woman must learn through her own experience to place a right value on them.

Before outlining the ways in which the methods and ideals of the home can be worked out in the college hall, I would say a word as to the human material to be dealt with. It is a body of eager, teachable, well-meaning, responsive women, no longer girls, entering with enthusiasm upon a great new experience, ready to make the most of their opportunities and characterized by those qualities of intelligence, adaptability and alertness which distinguish the American woman. In these respects there is no difference between those who come to the college from the East, the Middle West or the Pacific Slope. Everywhere, of course, there are occasional exceptions, the giddy, the flirtatious, the vulgar, but they are so rare and unimportant that they need not be considered as a class. Their omission from consideration as a factor in the problem leads to their disappearance. Any system, social, domestic, or educational, in the college which is

based on their needs or on the assumption that they exist in considerable numbers is bound to be a failure, not only for others, but for them. A system which will permit of individual treatment and the speedy elimination of the obviously unfit and misplaced is the only proper system.

The first aspect of the family which should characterize the residence hall is *corporate life*. It should, as Professor Tufts says of the family, "afford an opportunity for training in those qualities of disposition and character which are essential to citizenship." Mr. Flexner's idea of the failure of the college to train a boy to be a member of an organized order with obligations and privileges is quite to the point here. The college hall is not at its best when, to paraphrase his words, it is "a mere mosaic of sharply accentuated personal units." The organization of the group living in the hall should be such, then, as to bring all into relation with all and to have all realize the privileges and obligations which must be recognized if the life is to bring adequate results. I do not mean by this so-called "student government." The term "government" seems to me to have no more place in such a group than it does in a well-organized family. There is no question there of government in all the countless details which make up the sum of the daily life. It is coöperation, mutual understanding, sympathy, generosity and thoughtfulness. In the crisis, the sorrow, and the problem, the greater experience and wisdom of the parents are drawn upon, and likewise in the college home there must be some authority or permanent directive power ready to act in emergencies and to guide the complex group. For complex it must and indeed should be, and there should never be any attempt to grade or classify students in assigning them to college homes. Older and younger, grave and gay, cultured and crude, experienced and immature, gathered in one group mutually give and take in ways which react favorably for all if the right spirit prevails.

The means by which this corporate life may be developed and moral results secured from it are very simple, and again are such as characterize successful family life. One of the pleasantest and most effective is *the exercise of hospitality*. Here the whole household may be brought together, each member with a share in the preliminary preparations, each jointly responsible as hostess, and the occasion may be so planned as to afford opportunity for the use of individual gifts in music, acting, decoration, business arrangements, or social grace, and, what is still more important, to serve as a means of education

in these directions for members of the group who have had little experience or training. Intra-hall social gatherings, large and small, also serve to bring out strong feelings of mutual interest and obligation.

The *architectural features and domestic arrangements* may be made to contribute largely to the success of this phase of education. Convenient, attractive rooms for social purposes, and a flexible system in the housekeeping department are essential. For the birthday party, the entertaining of a mother or visiting friend, or the celebration of some event of interest to a small group, opportunities for special luncheons, dinners or teas should be provided, and equipment for light cooking more convenient and more safe than the chafing dish may be the means not only of great enjoyment and comfort, but of real and valuable training.

In connection with small social and hospitable ventures of this kind there is opportunity for the discussion not only of the unimportant conventionalities, such as forms of invitation and proper methods of receiving guests, but of the more important questions of the chaperonage necessary when the gatherings include both young men and young women, the occasions on which supervision is desirable and the ways in which they may meet with assured freedom because of the certainty of adequate protection under a control which is largely the expression of the public opinion of the group. Men and women may thus have opportunities to meet simply, even frequently, without the feeling of sex-consciousness which is often aroused solely because of arbitrary prohibitions.

Another way in which the moral power which comes from coöperation in a common interest may be secured is through the discussion and formulation of house customs, and the determination of such details as the hours during which quiet should be maintained or the way in which Sunday should be observed. Responsibility for the order and attractiveness of the social rooms, for needed repairs and for the maintenance of a reading-room may be properly shared by the group. Conferences in regard to the renovation of furniture or decorations may serve a useful purpose, while an organized movement to secure needed improvements or additions to the furnishings, such as vases, lamps, or books, may be encouraged occasionally for the influence it fosters.

But the family does not fulfill its sole function when it trains its members to contribute to the efficiency of a larger group. There must always be a place in the family for the *development of individual*

powers. So too, with the college hall. Not only should it serve to make each individual a more efficient part of a larger whole, but it should afford an opportunity for the growth of those moral attributes which should mark human relations whenever one individual comes in contact with another. Persons living in isolated independence, a condition which theoretically has many attractions, lose the chance to gain breadth of view, tolerance of opinion, kindliness and generosity in act and in word, afforded by residence with others. It is a familiar fact that illness or sorrow or perplexity always arouse a spontaneous and unlimited spirit of helpfulness, and opportunities for its expression occur frequently and under many guises in a large household of women. Looked at from another point of view, the intimacy of this corporate life might be held to be a disadvantage as tending to curiosity, impertinent comment or gossip, but the diversity of occupation and interest of a mixed student body renders this result highly improbable.

In a residence hall directed by an educational institution, physical and aesthetic conditions may be effectively controlled, and it is not too much to claim that their ethical value is so great as to justify their careful consideration by competent authorities.

It might be inferred from what has been said that the argument from economy has no place in this statement of the function which a college home should perform. Quite the contrary! While it is true that such educational returns cannot be secured without cost, there is real economy in the investment, or, to put the statement another way, there is great waste in failing to make the investment. This investment means meeting the expense of the architectural, domestic and social devices which make practicable on the impersonal side all the conditions suggested, and the provision of wise and sympathetic leadership, by which the discipline gained in the class room, the library and the laboratory may be made a part of the daily living of every individual.

Not to make it means the failure to provide just the opportunity to acquire that power of expression, that facility in social intercourse, that ability to meet situations of an unusual and unexpected character, that dignity and poise, which insure that the intellectual and scholarly results of the academic experience will be made available in full measure.

Whether these influences will be completely realized or not will depend largely on whether the intellectual interests which are the basis for this collective life are given opportunity to contribute to

the life of the student. If in any institution the women have less than full recognition in the intellectual privileges, if there are not women in faculty and administrative positions of high rank, if the attitude either of the faculty or of men students towards the intellectual life of the women is patronizing instead of friendly, neither college hall nor any other device can make good the damage so wrought. Freedom in the generous restraint of family life can contribute to intellectual self-respect, but it can never be a substitute for the self-control and dignity growing out of the realization on the part of the individual that she shares with full and equal freedom in the intellectual wealth of the group of which she is for the time a member.

It is to be hoped that what has been said justifies these suggestions in the presence of this particular body. Just as in the daily life of the home, the principles not only of right living but of righteous living must be translated into terms of habit, so in the college substitute for the home there must be large opportunity for fine appreciation of the rights of others, delicate feeling for the needs of others, and an ever-widening sympathy, not only with the truths of nature and the facts of history, but with the frailties and the aspirations of human nature. It is from the natural relationships and problems of simple every-day life that may be secured the fine democracy and social power demanded of the educated women of to-day.

EDUCATION FOR ADMINISTRATIVE WORK.

Qualifications and Training of the Head of a College Dormitory.

LYDIA SOUTHARD.

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In the editorial of a recent magazine it was pointed out that a cynic does not become an expert, because to possess the authority of an expert a man must share in the movement of life. In no other way can he understand that movement.

Applying this general truth, a woman who is a cynic should never find her way to the headship of a college dormitory. One of the first requirements for the person who is to guide and direct others is a broad, deep sympathy, not sympathy of an emotional type, but the unfailing ability to see a situation through another's eyes, and to make him feel that his view of the case is not despised, even though the decision may go against him.

This requires, of course, the fundamental ability to see two sides of every question, and it means experience. This is not necessarily technical experience, nor is it always of the sort which makes the best showing on the application blank of an agency. It is a past record of sincere and straightforward dealing with every situation that one's personal life has brought. It is knowledge of struggle, of defeat as well as triumph, of discouragement, of waiting and of hard work.

But experience, to be complete, requires the brighter side also. We should know how others feel in gayer mood. We should be able to throw aside dull care on occasion and command enjoyment. Within the limits of refinement, the broader that field of enjoyment, the more useful we shall be in our relations to other people.

We are sometimes asked if the head of a college dormitory should be a college graduate. My own feeling is that this is not a necessity, but that it is very desirable. The fully equipped woman, fitted for her position by natural gifts, as well as by long and varied training, will surely find recognition in time. The college degree is an intro-

duction in academic circles, and in those places which are slow to receive domestic administration on its modern professional basis the possession of a degree may hasten the coming of that unquestioned position in the community which the head of the dormitory has a right to expect. Other things being equal, the degree sets a stamp upon her standards and her tastes and shows her to be already in touch with that life whose social and business relations, at least, she should henceforth represent. The head of a college dormitory has no more right to be a mere superintendent of servants than a college president has to be a recluse and an ascetic.

Should the head of a college dormitory have had student experience in this kind of work? Shining examples of success without this are undoubtedly on record, but as a rule the woman who enters dormitory work without having somewhere, sometime, been in close contact with numbers of other women subject to the rules which govern educational institutions, is at a disadvantage. How can she properly formulate regulations unless she knows what it would mean to keep them? How can she be thought by the students under her care to understand their needs, unless she can quote similar experience?

Another requirement is whole-hearted enthusiasm. A modern English writer has said that "To hurry in Egypt is just as wrong as to fall asleep in Wall Street, or to be found in a Greek theater reading *How to Make a Fortune with a Capital of Fifty Pounds*." To enter dormitory work with divided heart and preoccupied mind is worse than any of these things.

One occasionally finds a dormitory in which the work is divided into several coördinate departments, the head of each being answerable directly to a president or dean. This however, is an unusual arrangement, and the woman who would devote herself to the management of dormitories should be prepared to direct all phases of the work. She must understand the food question from the point of view of nutrition, economy, attractiveness. She must be a student of dining-room and kitchen service, and incidentally, a student of the psychology of those who eat and of those who serve.

Some of us believe that in the near future most colleges will own and direct their own laundries, and that this natural field for women, which is fast becoming thoroughly scientific, will attract some of the best trained minds. Long steps in this direction are already being taken, and the sooner our heads of dormitories come to know the latest ideas regarding this exceedingly important work the sooner will they

wish to help incorporate it in their own institutions. I hope the time will soon come when all who are studying for dormitory supervision will elect courses in institutional laundry work.

The subject of buying is immense and inspiring. When we consider that the simple furnishings of a college dormitory affect the health and happiness of hundreds, as college generations come and go; that the conditions under which these articles were made affect the well-being of thousands; that the selection and purchase of these furnishings mean either waste or economy for the institution; then the subject of buying becomes one of profound interest. No class room can supply all that is needed. The desultory visiting of stores and factories is not enough. Theory and practice should go hand in hand. Add to this visits to various institutions and consultation with the proper authorities. The experience which they offer for the common good is often valuable.

The special training for the head of a college dormitory thus embraces every department of domestic science. It should consist of the very best that reference books and experienced teachers can provide. I cannot emphasize too strongly, however, the fact that even this is not enough. Laboratory work is excellent, but it must be reinforced by field work. This should be of two kinds. The trained woman should not only know how to do the humblest task with her own hands, but she should have opportunity to test herself in this, under normal conditions. If she does not know how much time and effort are required to perform, in their natural setting, the ordinary domestic duties of an institution, she is not well prepared to organize her future household with any degree of fairness. She should also have practice in planning and directing the work of employees.

Two years of training in which theory and practice are wisely combined is none too much to devote to the preparation for so important a work. Even then a woman is wise to accept an assistant's position for a time, until she becomes thoroughly adjusted to the new duties.

It is perfectly true that circumstances sometimes alter cases, and that personalities frequently alter them even more. However, after seven years of the closest observation of these positions, and of the manifold demands made upon the women who fill these posts, I am more and more convinced that to shorten the period of training is usually only to make the work more difficult, if not less satisfactory, later on.

We are living in an age of restless protest against waiting of any kind. When we emerge from the training school we wish large salaries at once. The high cost of living is partly responsible for this, but another factor in the case is our ignorance of the pitfalls which await the inexperienced. If, when we leave the technical school, we could foresee these we would, I think, be more willing to walk with a guide for a time, even though the pay is proportionally less.

I believe that deliberation and thoroughness should be urged upon every woman who can possibly so direct her life, and that she should approach the care of a dormitory with thoughtful modesty. I ask you if hers is not, indeed, an all-round life. The duties and the privileges of it are worthy of the highest type of womanhood, plus the most liberal education that she can possibly obtain. Hostess, chaperon, friend of student and of employee, general administrator, dietitian, sanitary expert, buyer, all of these she may and perhaps must be, even within the limits of the same institution. An overburdened life, you say? No, a splendidly full life, a nobly stimulating life, a life which leaves little time for self-interest. The woman whose mind is set upon personal advancement should seek other lines. Let us say with Mrs. Browning in *Auora Leigh*: "Get leave to work in this world, 'tis the best you get at all;" and again, with another writer: "We enjoy ourselves only in our work, our doing; and our best doing is our best enjoyment."

Essentials in the Training of the Dietitian.

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The requirements in training the institutional dietitian must be determined largely through the needs to be met by her in the institution. These must be interpreted by the management of the institution, and modified by reports of institutional experience by women of Household Economics training, who are thus competent to judge whether their training has adequately fitted them for the work required in this field.

The needs of the average institution are summarized briefly in a recent paper on institution management, by Miss Patten, of the

Boston Young Women's Christian Association Home, and I take the liberty of quoting them, slightly adapted: (1) A liberal education for the quality it gives the woman herself and through her to others; (2) understanding of and sympathy with those among whom she works; (3) executive ability; (4) expert training in household management; and (5) business knowledge.

Unquestionably the liberal education, the equivalent of college work at least, supplies the most secure foundation on which to elaborate the necessary technical training, and affords the desirable background, represented by the trained mind. The technical training must be founded in pure science and to such work must be brought the trained mind.

The first requirement, a liberal education, should insure the second, that of "understanding of and sympathy with those among whom she works" through arousing her interest in social studies; and these two requirements should insure the factor so essential to successful institution work,—that of a comfortable, reliable personality.

The third requirement, that of executive ability, cannot be produced by any system of any school so far known, but may be developed by opportunities for practical work, provided there is a degree of such ability native to the student. Hence the importance of carefully selected and directed practical work in connection with training, and hence also, the futility of encouraging students with no native executive talent, to train for such positions as institution dietitians; their disappointment in their profession will only be equaled by their employer's disappointment in them as executive heads of departments.

The fourth requirement, expert training, must have its foundation in the exact and natural sciences, and in the group of studies represented by the subjects economics, social science, psychology, and education. These subjects may be pursued in the college and be followed in the technical school by the development of their application to the institution field, together with practice work in conditions approximating the institution field; or, what seems an economy of time to the mature student who has definitely chosen the institution as the field of her future work, the pursuit of groups of fundamental courses may run nearly parallel with the group of applied courses, all within the college period. This is now done in some colleges.

Mention must also be made of a third method, which has been followed by some technical schools—that of accepting pupils with little or no foundation knowledge in the groups of studies mentioned,

and attempting to make good this deficiency at the time of giving the technical training, all in the space of two years or less. The result in the graduate of such a school is an immature, untrained mind, unsuited to the demands of institutional life and work. Longer and thorough training is to be desired not alone for proficiency in technique, but also for the maturing of the student's mind, the formation of standards and the development of judgment.

There is given below a classification of the groups of courses fundamental to technical training of the dietitian, and with each group the corresponding group of technical courses—representing the direct application of the fundamental courses. (It is impossible here to attempt prescribing the exact amount of work which should be done in each subject, and this can, I believe, best be delegated to a committee on curriculum. I should say, however, that it seems wise to class all of the work here outlined as *required* work, and to expect a certain amount of elective work on the cultural side.)

PREVAILING COURSES FOR THE TRAINING OF THE DIETITIAN.

FUNDAMENTAL COURSES.

General inorganic chemistry
Organic chemistry
Analytical chemistry
Physical chemistry

APPLIED COURSES.

Group I.

Food production and manufacture
Household chemistry
Fuels
Physiological chemistry
Nutrition
Food economics
Dietetics
Institutional dietaries
Marketing
Textiles
Laundering
Sanitation
Housewifery
Food preparation

Group II.

Biology, bacteriology
Natural history
Physiology

Food production and manufacture
Physiological chemistry
Nutrition
Food economics
Dietetics

FUNDAMENTAL COURSES.

APPLIED COURSES.

Sanitation
Laundering
Housewifery
Food preparation
Hygiene
Home nursing
Emergency nursing

Group III.

Mathematics

Principles of accounts
Records
Estimates
Reports
General business technique

Group IV.

Economics
Social science
Psychology
Education

Buying
Business management
Food preparation and service
Selection of employees
Organization of service

The foregoing classification covers the general scheme of standard courses of study in our technical schools at the present moment. But there is criticism of it, both from institutions and from graduate dietitians, as to the meager practical work afforded in food selection, marketing and buying in general, ordering of meals, preparation of food, and the organization and direction of service.

The character of the criticism would indicate *not* insufficient instruction in the fundamental groups, *nor* want of application of these principles in the laboratory and field work offered by the school, but an *insufficient amount* of laboratory and field work, particularly of that sort affording conditions approximate to those found in the institution. Over and over again has the graduate worker demonstrated her ability to analyze and criticise conditions in her field of work, and at the same time demonstrated her want of ability to *maintain* in harmonious and efficient movement the complicated machinery of the dietary department. This is undoubtedly due to the emphasis given by the school to the development of the student attitude of mind and method in all work, at the expense of the acquisition of skill through *practice* work. The development of the student method of work is admittedly a necessary step in her preparation for useful work, but

it should be balanced by a large amount of practice in handling the problems of routine and emergency character peculiar to the institutional dietary field. She would then have so assimilated the fundamental principles demonstrated in the class room, as to be no longer conscious of them. The good habits of work formed in well directed, plentiful practice would have become her tools, and she would then proceed with confidence and ease in the handling of her routine and emergency problems. When she has reached this stage of efficiency and not until then, will she be truly useful to the institution, "worthy of her hire" and of the professional recognition she desires.

In this connection one is reminded of the critical inquiry often made, regarding the scope of dietitians' work, "Why should she concern herself with the practical handling of the work, the housekeeping aspect? Why concern herself about fuel, employees, furnishings, uniforms? Does not her training prepare her to criticise and advise in regard to diet, and is that not enough for the institution to expect of her?" The answer to such queries comes through years of experience in such work. Institution management more and more recognizes that permanent results are seldom achieved, indeed results of any sort are rarely attained, through *mere criticism and advice*. The regulation of dietaries, the improvement of food preparation and service, the reduction of waste—all are brought about through the *intelligent control* of contributive conditions—the immediate direction of employees and their recognition of the authority of the dietitian. She may "advise" or "recommend" that the refrigerators be cleaned regularly, but if she has not the authority to require this done, how can she be responsible if through another's neglect, the refrigerators are not cleaned, and food is spoiled and wasted in consequence? In the minds of many she will still be responsible, and her reputation is thus at the mercy of those who can not or will not coöperate with her. *Without* authority in her own department she cannot secure results which represent her fairly; and *with* authority inevitably comes responsibility. Thus we have the dietitian who actually controls the food service of her institution also controlling the employees of that department—supervising their department and uniforming, regulating their duties in the handling of food and equipment, and thus organizing her entire department for efficiency in food service.

Where she is hindered in the exercise of this authority, or where she is incapable of exercising it wisely, imperfection will result in the character of food service. When deprived of authority, she is helpless to secure results, and without results her position is not justified.

Something should be said of the precise nature of the practical work to be included in the training of the dietitian. Much of that previously mentioned (marketing, administrative work, etc.) can be obtained only in the actual field of the institution, where as a pupil dietitian she may develop and test her own strength in the capacity of assistant to an experienced dietitian. These opportunities now occur in many hospitals and college dormitories. At the present time, such work is taken at the option of the student upon the completion of her school work, and for it she receives recognition from the hospital, but not from the school. It would seem wiser if the school would recognize such practical experience as extension work in a field not provided by the school, preferably withholding its diploma until this field work is completed. The college offering domestic science courses and having its own dormitories is in a position to supply the field for practical experience under the control of its own faculty, and can give credit for such work toward diploma, certificate or degree.

In the practical work of food preparation, more experience is desirable than it is now customary to give. Graduates generally agree that their training on this side has been too small for the acquisition of skill. Of the special form of cookery known as "institutional," it must be admitted to be practically impossible to duplicate institution conditions in a school "laboratory kitchen," but the college dormitory kitchen and lunch room kitchen offer opportunities for experience under direction.

It is extremely difficult to obtain through courses now offered practical experience in marketing and buying. Still, these may point the way and afford an outline for future work to be carried on in the individual experience of the student. Actual knowledge of the food products of the world, and judgment formed by experience in handling these, should be part of the equipment of the dietitian for her work.

To those of us familiar with courses of study offered in Household Economics, it is apparent that the length of time required in preparation for work as a dietitian must inevitably lengthen. This will not necessarily take place in the technical schools through additional courses, but will be evidenced in college requirements including the fundamental courses outlined, and later in the requirement of from six months to one year of practice work under supervision. Probably six months of this could be taken under school direction and credit given accordingly; the second six months might well be taken in a

field of different character with maintenance provided. It would be safe to suppose the student capable by that time of rendering sufficient service to constitute her apprenticeship a mutual benefit to herself and the institution.

I would not close without repeating, and emphasizing if possible, what has been brought out several times to-day—the institutional field is too important, there is too much at stake in the institution, to admit of the employment therein of women not prepared to carry full responsibility; the present training afforded is not adequate on the side of practical work, nor of sufficient length to permit of the development of the average student to the necessary sense of responsibility in her institutional relations.

It would seem that important work for this conference would consist in making a thorough study of these conditions and eventually recommending the courses of study and the nature of the special training necessary in order to meet the requirements of the institution for the dietitian.

Practice Fields for Students in Institution Management Courses.

MARY URIE WATSON.

Macdonald Institute, Guelph, Canada.

It is only a few years since the idea that domestic science teachers required special training and practice teaching was recognized and provided for. The idea of practice fields for institution management is to-day quite new, but will soon be generally accepted.

The domestic management of large institutions, hospitals, schools, dormitories and asylums cannot be conducted in the same way as in a single family. So far such management has been solved by capable subordinates through their own powers of observation. When opportunities offer they are given the chance to prove their capacity. Some are plunged into such work and are left to sink or swim, and it is wonderful how many do learn to keep their heads above water. Very few have special training, and no training school can provide practice in actual conditions and prepare for an independent work. It is cruel to send a fresh graduate in all ignorance of institution life into full responsibility for such work.

The apprenticeship system is the best and only practical solution. It is the same idea as practice teaching in all our normal schools; only the field of practice is larger. The students must have opportunity to study the field, to make plans for supervising, equipping and running such plants and to have their plans and performances discussed by a competent critic.

The essentials for such an apprenticeship system are: First, that the authorities and superintendents of such an institution should be in entire sympathy with the idea; second, there must be an exceptionally competent housekeeper or matron who has the teaching spirit. Difficulties must be found out and ways to meet them devised. The institution housekeeper must be so able to utilize the work of apprentices as to make it worth while to have them come. When boys spend five or six years in learning a trade, the work they do is of value to their masters. Teachers and housekeepers, as well as administrators, must do work of value. An apprentice should be willing, on graduating from her training courses, to work for her living and a small salary in return for the hardest work she can give. She should be mature and have good home experience. She should have native executive ability and special training in the fundamentals of all institution work.

The Pupil Dietitian.

GRACE E. MCCULLOUGH.

Massachusetts General Hospital.

The outcome of the section for dietitians which was held at the time of the annual meeting of the American Home Economics Association in Boston, in December, 1909, was the opening of the doors of the Massachusetts General Hospital, Boston, to pupil dietitians with a view to furthering the subject of hospital dietetics. At that time an earnest appeal was made to hospitals, domestic science training schools and students. The time and harvest were ready, but the laborers were few.

Miss Florence E. Crapsey, a graduate of Teachers College, was the first to apply and was accepted. She completed the course in October most satisfactorily and writes of the work as follows:

The course consists of three months without salary, but with maintenance, the time and work of the pupil being directly under the supervision of the resident

dietitian. Forty-six hours weekly plus ten hours every other Sunday were spent on duty. The management of the diet kitchen, insight into the main kitchen, daily ward supervision during the serving of meals, the ordering of food stuffs, the preparation of formulae for infant feeding, along with other special diets, constituted the work.

The training has afforded knowledge of the practical side of a dietitian's work along with some theory and new scientific facts; given an insight into the treatment of certain diseases caused by errors in diet and the preparation of proper diets; fostered the ability to manage adult students; made familiar the routine life of an institution; assisted toward the control of the cost of living with the present high prices; shown how to cope with the labor problem; given confidence, and extended the scientific knowledge gained at college by its application.

While many smaller hospitals may undoubtedly give certain opportunities, it is only in a large one like the Massachusetts General, which is well organized and systematized, that one can get full benefit of the time expended.

A course of lectures was also given before Miss F. M. Farmer's Summer School of Domestic Science (1910) upon institution management, with special reference to the dietary department. The building and location; the kitchen and its permanent and portable equipment; cold storage, and storage space; food, a system for order, purchase, care and economy; some phases of the help problem; and an outline for a diet kitchen, touching upon a few special diets for special diseases, were among the topics discussed.

Preparation for Institution Management.

FLORA ROSE.

Cornell University.

So many people are asking what the schools and colleges where Home Economics is taught are doing to train women for institution management from the personal point of view, with reference to the one who is to administer the work, that it does not seem amiss at this time to look ahead a little and tell something of the plans which Cornell is making for a course in institution management.

Training for institution management presents a complex problem, for it necessitates a range of practical experience built upon a thoroughly scientific foundation. In planning for this work it is our belief that a four year college course is none too long to give the systematic, all-round training needed as much here as in any other line of work. Institution management will, therefore, take rank with other college

courses. The training will include the same two-year foundation of work in biological, physical and social sciences as is required for other courses offered under the name of Home Economics. The same fundamental food and dietary work will be given as to those who expect to be teachers. A way, however, had to be found for offering real and practical experience in work along institution lines. Just as a medical college must have clinics for the development of its physicians, teachers must have experimental schools; therefore, courses in institution management must develop in connection with some institution.

This year the New York Legislature appropriated \$154,000 for a Home Economics building at Cornell. In planning this building there were always in mind the manifold sides to Home Economics and the need for giving an opportunity for specialization in various lines of activity. Since there was to be a new building, it seemed best to take this fact into account at once and to develop the building to meet our own particular needs.

As the plan now stands, the basement, which is to be parterre, will contain a cafeteria where as many as 1500 persons may be served. This cafeteria will be under the management of a trained woman with a place on the Home Economics teaching staff. Under her jurisdiction students specializing in institution management will gain a first hand knowledge of economics, physiology, and psychology of the feeding large numbers.

A small commercial bakery and laundry, also to be used as 'experience' laboratories, will complete the basement plans. Besides the usual food laboratories, common to all Home Economics departments, one floor of the building will be given over to a dormitory accommodating about thirty students. This will also be used as a working laboratory for those students specializing in institution management, and it is hoped that many practical dietary experiments may be carried out there. It will also be possible for students to obtain further experience by observing methods in the larger women's dormitory of the university, where some three hundred persons are cared for.

Additional Points Brought Out in the Discussions and in Correspondence.

Standards of Training.—Women say they can get good wages without training. Why then spend money to learn? It will take time to educate both women and institutions to the need of this training.

On the other hand, the inquiry often comes to leading workers, "Can you find us a woman who is trained?" Nothing is even said of salary, the need is so great. We might begin with shorter training to meet the present urgent demand and then develop. The training to-day is better than anything we have had before. Some institutions already require that a dietitian shall have two years' training.

All the training and theories of all the schools cannot give a woman the ability to "get under a big job" as hotel men say. This is a matter of native ability and executive traits.

In fixing standards for certified public accountants in New York it was necessary for the legislature to enact a law which threw out of business some men who had signs out.

As previously noted, it was voted that the American Home Economics Association appoint a committee of five to formulate standards for training for institution management.

Apprenticeship.—The length of time ordinarily available for apprenticeship work was felt to be too short, one month often being spent under one head and perhaps two months with another. An institution also suffers from such apprentice work. Six months at least is needed and two years would be better if possible.

In Canada more and more applications are being received from mature women who have already had good experience in household affairs; sisters who have kept house for brothers and are stranded when they marry often show remarkable ability.

Should there be an age limit? Mechanics Institute requires candidates for lunch room work to be at least twenty-five years old. No younger woman could do the work, and she should be thirty for factory and school lunch room positions. There are often very trying conditions, employees being proverbially hard to suit and sometimes discourteous.

Is it a matter of the almanac or of tact and temperament, was asked. Institutions which are able to offer the best practice field for apprentices often cannot afford to take them, while those institutions which take them to save wages will not teach them well and are poor places for apprentices. On the other hand, if an institution gives \$100 worth of time for \$25 worth of work it is a good place for apprentices but serious for the institutions. Is it not possible to have a few recognized practice institutions of the right kind?

METHODS OF ORGANIZATION AND CONTROL IN INSTITUTIONAL DEPARTMENTS.

Menus and Meal Systems: A New Plan.

ANNIE DEWEY.

Lake Placid Club.

There is much talk concerning the high cost of living, but few practical suggestions as to how to lessen this cost and still give the comforts and luxuries which to many have become necessities. Much lavish expenditure is due to thoughtlessness and early habits of extravagance which cultivate needless waste.

As man grows prosperous his first indulgence, as a rule, is in increased variety and expense of food. When he entertains, all parts of the world are taxed for costly viands, and skillful chefs are paid more than college presidents.

The day laborer takes his dinner from a single plate with but one knife, fork and spoon, while the guest at a modern banquet uses some thirty to fifty articles in china, glass, silver and linen. There is no other function common to man which so stamps his ideals and attitude toward life as the simple act of eating.

Nature is lavish with all those elements that must meet man's largest needs, air, water, fruit, grains, and vegetables, but she is equally sparing with those which it would not be for his benefit to use freely. Nitrogen, so essential for both plant and animal life in proper quantities, brings heavy penalties when used too lavishly, and so "men dig their graves with their own knives and forks," not realizing that it is a surplus of nitrogenous food, the most expensive of all, viz. the animal proteids, which is directly the cause of very many of our modern diseases, in some form of auto-intoxication. Mrs. Richards says: "Public men are dying, not of overwork, but of their dinners."

The modern problem of feeding large numbers has resolved itself into a choice of meal systems known as the European or à la carte, table d'hôte, American, and various combinations of these three.

In hotels and restaurants, where many tastes must be met, custom has established a long menu with a bewildering choice of expensive nitrogenous foods, the most costly the market affords. A recent study of typical lists shows in one case as high as 541 distinct articles served to order at a single meal, 379 of these being either meat or fish in some form. This is supposed to be the demand of the better class traveling public. In many such places a duplicate staff with separate chef comes on for night duty and meals are served at all hours. Expenses are enormous and the public must pay in proportion. Such food soon acquires a money flavor from its costly price. Simplicity is naturally promoted but there is an unfortunate tendency to shut out vegetables. A man often makes a meal on porter-house steak, reversing the relative proportions of protein and carbohydrates required for the best nutrition. The limitations of table d'hôte service seldom give sufficient choice to meet individual needs and peculiarities of diet. Where followed regularly, the special orders required are numerous. "To eat a table d'hôte dinner is like landing a fish which has been hooked and played by some one else."

Children brought up in American plan hotels and allowed to choose freely from a varied menu, soon acquire the habit of extravagance and mix many kinds of food, some requiring a long and some a short time for digestion, and are especially prone to overeat in meats and sweets. The seven-year old daughter of a college professor was seen to have five desserts before her which she nibbled, tasted and wasted, the only comment of her mother being "Why, Margaret!"

A young man ordered one morning for breakfast two services each of chops, steak and broiled chicken and then sent for a third order of the chicken.

During the last decade, while the cost of living has been steadily advancing, hotels and restaurants by the hundreds have changed from American to à la carte system, being forced to it by the growing waste and extravagance. One manager fixed a date on which this change would go into effect and noted carefully the result with one man who usually had specially hearty breakfasts which at à la carte prices would average to cost over \$2 each. His first order on the day named was a pot of coffee and two boiled eggs. He drank one cup of coffee, ate one egg and then asked the waiter to save the rest for his wife, who would be down later.

A growing number of people take regularly only a continental or light breakfast. Others have learned that meat not more than once

a day, especially in warm weather, is far more healthful. It is certainly unfair that these persons should be taxed for the waste represented by the young man who wished seven orders of the most expensive meats at a single meal which would have cost him à la carte over \$5. It seems as unfair to charge all persons the same price for meals as it would be to make all laundry bills uniform, allowing each to send as much or as little as he chose.

Summer resorts are the last stronghold of the American system. Europe has never adopted it, a limited table d'hôte being the nearest approach.

In the effort to provide college students with satisfactory meals at the lowest possible prices, Harvard University has tried some interesting experiments at Memorial Hall for several years, which have been copied at Yale and elsewhere with more or less success. As formerly conducted on the American plan, Memorial Hall showed, on a conservative estimate, a waste in meat, fish and eggs amounting to about \$900 a month or over \$8000 for the college year. Men used to boast of three, four, and even six large orders of hot roast beef at a single meal, three quarters of a ton of raw ribs of beef, costing over \$200, being required for one meal. Each man ordered as many helpings of everything as he pleased. Waiters were liberally tipped and brought more plates of food than were ordered, these got cold and were wasted. Many ordered more than they cared to eat, so as to select the best. The point was that they were not directly paying for it.

In 1903 the new system was introduced whereby a fixed price was charged covering certain essentials or constants for each meal which would give sufficient plain nourishment to support health. Bread, butter, cereals, soups, most vegetables, tea, coffee, and milk were on this list, while cream, eggs, fruit, fish, meat, salads, and desserts were paid for by coupons at cost price. These coupons (alimentary canal mileage) were like so many postage stamps. No slips or signing of order blanks was required but a checker at the door examined and passed each tray. Every man thus had just what he paid for. Tips and fees were abolished and waiters were paid increased wages for efficiency, based on length of service, the price being raised for three successive years for all who were efficient enough to be continued in service.

This plan with some variation was in operation about six years when it was announced that the dining association was in debt over \$100,000 and that Memorial Hall would be closed. It was, however,

reopened with a changed plan, a simple table d'hôte meal being served at a fixed price and each menu having a list of special dishes which could be had on written order at about cost. A fuller separate list offered larger choice by "delay of order" cooking.

The average membership of late has been 800. Were it possible to keep 1000 members during the entire year, excellent board could be furnished at a low price. There are always certain fixed charges which must be paid irrespective of numbers, and 1000 students are required to meet this cost. All above this number contribute to profit, whereas any shortage adds to the deficit.

It is usually supposed to be much cheaper to feed large numbers from a common kitchen than for families to keep house separately, where, as in block after block of city homes, different cooks are paring potatoes and doing about the same things at the same hours for small groups. There seems to be some fallacy, however, when we find that it is impossible to give students simple meals at \$5.50 a week with a membership under 1000, especially when no rent, taxes or living quarters for servants are required, as in the case of Memorial Hall, and when all modern labor-saving devices in equipment are supplied. The Hall is, however, carrying interest charges on the old debt.

As a matter of fact, when many live together they have, besides individual needs, common needs which have to be supplied at common expense. Three hundred years ago the water system of New York probably consisted of a town pump, whereas the new Ashokan water works when completed will cost \$300,000,000. New Yorkers to-day pay water taxes of \$12,000,000 a year. Streets, pavements, sewers, police and fire protection have similarly developed.

Where every expense connected with preparation and serving of food must be fairly included, the results are somewhat astonishing. Recent records of the Lake Placid Club show that the number of guests in August reached 808, the average number for three summer months was 504, and for the entire year 167. About 400 employees were fed in midsummer and 50 or more in winter.

Among the common needs, express, freight and teaming for the table alone were \$5024. Laundry, including not only that of table linen and towels (side, silver, dish and cooks') but uniforms of cooks, tray boys and waitresses, fuel, ice, light, water, rent, breakage and depreciation of china, glass, silver, table linen, cooking utensils and other kitchen and dining room furnishings, railway fares, uniforms,

rubber heels and other supplies, came to \$29,968, a per capita daily average of 49.8 cents. Wages for the year averaged 42 cents and raw food materials \$1.13 per guest. The care of rooms cost 10 cents each. Meat, fish and eggs (with milk and cream), the expensive nitrogenous elements, constituted nearly two-thirds the total cost of food.

In addition, every summer plant is equipped and manned to meet the needs of the largest numbers during the few crowded weeks in August. An expensive cold storage plant with butcher and assistant, a grocery store with a special book-keeper and helpers, large refrigerators and coolers with each kitchen, and enormous ice supplies are required.

Comparisons with several other resorts of similar grade confirm these figures. In one case the food per capita was \$1.17 and wages 40 in place of 42 cents, waitresses being paid less and expected to make it up in tips and fees. In another, where the menu showed greater variety, the food cost \$1.25. Curiously enough, not a single resort made a per capita allotment for common needs or had any system of accounts on which such could be based.

Studies show that with an average family of six persons, without a servant and usually in a rural region where part of the food comes from the garden, it has been found possible to support health on a rather monotonous diet at an average daily cost of 10 cents each for raw food materials.¹ A well-to-do family of the same size having one servant and some outside help, spends about 16.6 cents for wages and 61 cents each for food daily. In prosperous families with two domestics, wages run from 20 to 28 cents a day per capita and food varies from 60 to 75 cents or more, according to standards of living. It is even more difficult to estimate common needs for individual homes since separate account is seldom taken of small items which melt into general living expenses. Food and wages alone are usually estimated in both families and resorts. On this basis the two types of families quoted would spend from \$140 to \$185 a month in the home, an average of \$162, while the Club figures would make the actual cost \$279 a month. Adding fixed charges and the care of rooms which family wages cover, the total would be \$387 a month, if all were adults.

The term calories as the measure of food units is becoming almost

¹ U. S. Dept. Agr., Office of Experiment Stations, Bul. 221.

as common as the term horsepower in engineering. Science has proved conclusively that of the various nutrients needed to keep the human machine in the best condition of health, the amount of the most expensive foods is the smallest. Dr. C. F. Langworthy of the U. S. Department of Agriculture claims that 100 grams protein, with fat and carbohydrates enough to make a total energy value of 3000 calories for adults with active exercise, is a proper standard. This standard, it must be remembered, is offered as a guide for homes and institution management, and not as an expression of physiological requirements. As these quantities should vary in proportion to age, height, normal weight, skin surface, amount and kind of exercise, and other factors, the question of food becomes peculiarly an individual one, and the only fair solution seems to be for each to pay for such expensive foods as he needs or insists on having because "they taste good."

Man has long studied a balanced ration for his cattle, his horses and his hogs. The application of science to his own needs, an intelligent effort to preserve the equilibrium of elements with which nature has endowed him, would not only create a balance in favor of health and efficiency but increase the bank balance also.

If the desire for simpler living, so often expressed, were really genuine, the people of large means who can live as they choose would set the example, as a matter of principle. Men have learned that educational forces pull from the top, they do not push from the bottom. In Hindu philosophy the man or woman who has the smallest needs is considered to be nearest perfection; he becomes the ideal of the nation since they place the spiritual plane above the worship of wealth, the power of money. There were no saloons or slaughter houses in India till the British government established them. A high caste Oriental said of Anglo-Saxon beef-eaters: "Each stomach has become a cemetery and every tooth stands like a tombstone."

Men create tastes and then say they cannot live without them. "Simple living is not equivalent to poverty, nor does it mean ignorance. It is the result of the highest education, the moral and spiritual training of the soul. It includes sincerity of thought, word and deed and has been held in the Orient from time immemorial as the best means of attaining to perfect peace and happiness on earth. Simple living does not mean a life of retirement, that we must go out of the world and live in forests and caves, but it means absolute obedience to the laws which govern our physical, mental, moral and spiritual

being." Simplicity as a modern ideal means comfort without luxury, material conveniences which make for efficiency rather than effeminacy. A menu based on these ideals, in place of offering everything which the market affords to tempt worn out appetites, would aim to meet certain essential principles.

(1) *Select foods that are in season.*—A German proverb says: "To eat asparagus in January is not only to waste money sinfully, and to eat a tasteless vegetable; it is to introduce a discord into the harmonious scheme of things." We naturally associate seasons of the year with certain foods and in so far as we depart from this principle the highest enjoyment of such food is dulled. Avoid canned fruits and vegetables as much as possible, keeping the fresh zest of their enjoyment for their appropriate season.

(2) *Delicate seasoning.*—A famous French chef said: "Monsieur, I am very pleased that none of the gentlemen last night touched the salt cellar. I could not desire a finer compliment." A cook having any self-respect or any respect for his art has a right to feel insulted if a guest powders his food with salt and pepper before having tasted it. Some one has said: "The cruet stand is a hideous and ever present reminder of the wretched state into which the art of cookery has fallen in Anglo-Saxon countries. Seasoning is the business of the cook and cannot be imparted afterwards."

(3) *Simplicity, with variety from day to day.*—This means enough reasonable choice at each meal to meet the needs of different ages, tastes and digestive powers, seeking the best quality of foods and sanitary and hygienic conditions, and aiming always at the perfection of each individual dish, and that it be served with the least possible injury from delay. The most artistic and the most wholesome ways of preparing foods are usually the simplest.

(4) *Right combinations of foods.*—Instinct seemed to guide refined taste long before the scientific reasons for certain combinations were understood. Custom has so sanctioned these that there has grown up an elaborate creed or etiquette of good form for the palate; but "the art of cooking, like that of dining, should be exempt from the caprices of fashion. The principles of both these arts are eternal and immutable."

The preparation and serving of meals naturally divides itself into three groups of expenses—raw food materials, wages, and common needs or fixed charges. The two latter can usually be fairly estimated and will be reasonably stationary in any one year. The bulk of the

food needed, the carbohydrates which make about 60 per cent of the total food supply, are also reasonably permanent. Fats are seldom reckoned separately, being combined with other foods like bread and butter, cereal and cream, and in various kinds of meats. There is left only the protein which may vary greatly in price and in amounts consumed, according to individual needs and tastes.

Our Club figures for the past year show an average daily cost of food per capita as follows: Eggs, 10 cents; fish, 5 cents; meat, 42 cents; butter, 10 cents; milk and cream, 17 cents; groceries, 17 cents; and fruits and vegetables, 12 cents; making a total of \$1.13. It would, then, be possible to offer a combined American-European meal system at \$1.50 a day, which would cover the cost of wages, fixed charges and a complete menu except eggs, fish, meat, and specially expensive dishes. These could be served to order at nearly cost price, which would be from one-third to one-half the usual restaurant charges. Cream beyond an individual 4 oz. portion and extra desserts should be on the order list. Porterhouse steaks could be ordered for families at less than separate sirloin or tenderloin portions and would be far more appetizing cooked to special order. Food ten minutes from the fire to the table is often spoiled. To come promptly to meals at a fixed hour not only insures food at its best but also preserves family life. "To have perfect food one must eat in the kitchen."

Those who take meat but once a day could thus easily save \$4 or \$5 a week, while in families of six or eight it would make a difference of \$25 to \$40 a week and every requirement of health would be met. An enormous amount of waste would be eliminated if the system were widely adopted. Heavy meat eaters would naturally prefer the old American plan, but it would be only fair that they should pay a somewhat higher price if the two plans were in use at the same time, since those choosing the fairer system would not be contributing to cover the continued waste.

Table d'hôte meals with choice of courses could be served from the same simple menu at \$2 a day, but it would be distinctly undesirable to have more than two plans in operation at one time from one kitchen. There would be absolutely no class distinction in serving meals at different prices, since one who avoids too much protein is following the best teachings of science, proving that his standards of living are based on higher ideals of health and efficiency.

There are many possible applications of the same system. Since the fixed price would cover expenses of usual Club standards,

those wishing more luxuries, such as extra heavy cream, three fresh napkins instead of one daily, special pots for tea and coffee, smaller tables and a waitress for less than eight, or family style with many service plates, would pay such additional sums as would fairly cover these extras, above the 50 cents average per capita, without taxing those who do not care for them.

The proposed Lake Placid plan, a combined American-European or Ampean system, offers absolute fairness with a minimum of annoyance from change and is applicable to all grades of hotels and restaurants, since wages and the fixed price may vary with local conditions as well as à la carte extras. A fair percentage could be added as a margin of profit where meals are served on a commercial basis, the Club meals being at coöperative cost.

As carbohydrate foods, the bulk of the food which nature requires, would still be on the American plan, purse-strings would act as automatic levers to control protein balance. Health would be promoted, since it is largely a surplus of meats and sweets by which the system clogs, as a furnace does with clinkers and ashes. Auto-intoxication by poisonous gases is the inevitable result, producing many diseases. The human machine is specially dependent on the cleanness and clearness with which the fires are fed by food fuel: If the standard of human efficiency is to be raised (as it can be without doubt) the natural forces of the body must be conserved that the brain may work with clearness and precision.

There is growing interest in the new science of eugenics, which deals with race improvement through heredity, but there must first be a recognized science of right living, seeking race improvement through environment. "Human vitality," says Irving Fisher, "depends on two primary conditions, heredity and hygiene, or conditions preceding birth and conditions during life." Euthenics is the term proposed for this preliminary science on which eugenics is based. Years of careful investigation are required for the latter, but there is immediate opportunity through increased scientific knowledge to create better conditions of living, which will inevitably create a better race of men in the future. Balanced meals would mark one important step in the effort to lessen disease and develop more efficient human beings. "To that nation which best adjusts its conditions to the demands of the future, the leadership of the world belongs."

SUGGESTED PRICES FOR A COMBINED MEAL SYSTEM.

Eggs: Raw or cooked, 5 cents each.

Fish: Single portions, 5-20 cents; fish cakes, 5 cents each.

Meats: Beef—Roast, 25 cents; steak, 25 cents; sirloin, 30 cents; tenderloin, 35 cents; porterhouse, 75 cents, \$1, \$1.50, according to size; casserole and croquette steaks, 15-25 cents extra; chipped, hashed, minced on toast, 15 cents; with eggs, 5 cents each extra; corned beef, beef stew, tongue, 20 cents. Lamb—Roast or boiled, 20 cents; hashed, minced, or stewed, 15 cents; with eggs, 5 cents each extra; chops, 15 cents each, 2 for 25 cents. Chicken—Roast or boiled, 25 cents; broiled half of a 1½-lb. chicken, 35 cents; creamed, minced or fricassee, 25 cents. Ham—Broiled, frizzled, or fried, 15 cents; eggs, 5 cents each extra. Bacon, 15 cents; eggs, 5 cents each extra. Liver and bacon, 15 cents. Sausage, 15 cents. Tripe, 15 cents.

Cream: 4-oz. individual pitcher of 25 per cent cream, 5 cents; 35 per cent, 10 cents; ½-pint pitcher, 25 per cent cream, 10 cents; 35 per cent, 20 cents.

Desserts: 1 choice free; each additional, 10 cents extra.

SAMPLE MENUS FOR ONE DAY.

Breakfast.

Blackberries	Melons	Pears	Prunes
Oatmeal		Farina	
Shredded wheat	Force	Puffed rice	Triscuit
Apetizo		Corn flakes	
Baked beans	Tomato toast		
Baked new potatoes		Potatoes hashed in cream	
Toast: Dry, buttered, dipped, milk			
Rolls		Corn muffins	
Bread crumb griddle cakes			
Tea	Coffee	Cereal coffee	Cocoa
			Milk

TO ORDER.

Broiled lake trout	15 cents	English breakfast bacon	15 cents
Broiled lamb chops each	15 cents	Creamed chicken on toast	25 cents
One small and one large	25 cents	Creamed codfish	10 cents
Ham omelet	20 cents	Eggs to order, each	5 cents

Dinner.

Consommé vermicelli		Green pea soup
Olives		Spiced pear
Baked bananas		
Boiled potatoes		Mashed potatoes
Club garden peas	Boiled rice	Summer squash
Lettuce		Cucumbers

	Pumpkin pie	
	Fruit jelly with whipped cream	
	Caramel ice cream	Cake
American and Edam cheese		Wafers
Tea	Coffee	Milk
	Spring water	

TO ORDER.

Salmon baked in cream with	Lamb stew with vegetables..	15 cents
French fried potatoes.....	Salted almonds.....	10 cents
Roast beef au jus.....	Extra dessert.....	10 cents
Roast duckling, apple sauce..		25 cents

Supper.

	Lamb broth	
	Steamed samp with cream	
Stuffed olives		Tomato relish
	Stewed kidney beans with mushrooms	
Baked potatoes		Delmonico potatoes
	Vegetable salad	
	Orange ice	
	Toast: dry, buttered, dipped, milk	
	Morningside muffins	Tea biscuit
Fresh raspberries		Comb honey
	Assorted cake	
Tea	Coffee	Cocoa
	Club Farm cottage cheese	Milk
		Buttermilk
		Toasterettes

TO ORDER.

Broiled spring chicken.....	35 cents	Eggs to order, each.....	5 cents
Roast beef hash with celery.	25 cents	Cheese omelet.....	15 cents
Deviled ham on toast.....	15 cents		

Cold Meats.

Beef.....	25 cents	Lamb.....	20 cents
Ham.....	15 cents	Tongue	20 cents

POINTS BROUGHT OUT IN THE DISCUSSION.

People of wealth now, it was stated, live more simply; there are fewer wines, fewer courses and less elaborate entertaining.

It was reported that on the Biltmore estate near Asheville, N. C., the Vanderbilts had recently reduced the number of servants from 37

to 11. Simplicity is not inconsistent with high standards. An Adirondack hotel used to advertise "carved furniture in every bedroom." The Lake Placid Club spends lavishly on things that involve health, such as sanitary plumbing, fire protection, and the best quality of foods, but not a penny on elaborate luxuries or displays.

In hotels and restaurants, waiters dislike to serve women. They do not order substantial meals or give large enough tips. A discussion of menu schedules from the dietitian's standpoint is much needed. Simplicity and intelligence should evolve an ideal menu.

It was voted that the conference stand on record as opposed to the vulgarity of so much display and elaborateness in menus, and that the committee on resolutions be asked to formulate such a protest.

Dining Room Management.

CHARLOTTE M. WAY.

Rockford College, Ills.

The points to be considered, many of which are subject to great variation, include the following:

- (1) Number of meals per day.
- (2) A. Cafeteria for factory or school lunches.
B. Complete meal (served by maids):
 - (a) Served simply.
 - (b) Served in a number of courses, either individually or in family style.
- (3) Length of meal hour.
 - (a) Wide limits of time, subject to the pleasure of the guest.
 - (b) All served at one time, according to schedule hours. This gives more time to maids for side duties. When needed they may share in chamber work and begin the preparations in kitchen.
- (4) Furniture.
 - (a) Shape, capacity, and arrangement of tables in the dining rooms. Round tables (5 ft. in diameter) and square tables (4 ft. square), each seating eight persons, are the best standards for regular use. Larger and smaller tables may be needed for special conditions.
 - (b) Side tables—(1) small; (2) two shelves and top; (3) at least one table for each maid.
 - (c) Rolling tables, carrying at least two shelves or trays, for handling heavy loads before and after meals.
 - (d) Dish-washing machine for stone ware (or china).

(5) Organization of service.

- (a) Whether the care of the rooms, dining rooms and kitchen is under one or separate heads. If under separate heads, the work is better kept apart.
- (b) Force of workers—men, women or a mixed force. Women adapt themselves more easily to a diversity of work.
- (c) If the time in the dining room is short, waitresses may divide among themselves (either permanently or alternating) the care of the bread, butter, relishes, fruits, and salads, and perhaps the care of urns. This work should be under the supervision of one person, either the head waitress or head pantry-woman, for the avoidance of waste.
- (d) Care of table linen, side towels and aprons. The inspection, counting and preparation for the laundry, as well as the care and distribution when clean, should be under one head for the sake of the linen as well as fairness to the workers.
- (e) Control of breakage of china and glass must be gained in some way.
 - (1) By personal report to the head officer.
 - (2) By a fine of those breaking, consisting of a certain percentage of the cost, or by both the above means as needed.

The general spirit of service and loyalty to the employer must be a large primary element in controlling this problem.

- (f) Each waitress should be responsible for the care of her own silver.
 - (g) Workers should have their own dining room and eating elsewhere should be prohibited.
 - (1) Their meals should be served from 30 to 45 minutes before the regular meal. This improves the service in both the dining room and kitchen.
 - (2) When the general dining room is served family style and the help has the same menu economy may call for the maids being served afterward.
- (6) Management of the dining room from the student point of view. (This is a very large subject, which I can but touch upon.)
- (a) *No food* must be taken from the dining room to private rooms except by written order.
 - (b) Tray-service must be paid for by all the family.
 - (c) Food not on the menu may not be served without the doctor's order, except eggs for breakfast and lunch. These should be signed for.
 - (d) Food may be sold from the store-room at regular hours for the convenience of the family.
 - (e) Student dinner parties.
 - (1) Numbers limited only by the sizes of tables (8-18).
 - (2) Menu: simple, extras being provided by the hostess, or by the kitchen at her request and practically at cost.

- (f) Arrangement of table groups by an officer of the college and their rearrangement every five or six weeks is a valuable custom to cultivate general acquaintance and good comradeship and overcome the tendency to cliques.

NOTE. Relation of domestic service to the general labor problem. Definite hours of labor and times off duty is one of the most important questions in getting good help. When women have worked in stores or factories they object to the usual unorganized labor and long hours demanded in domestic service.

Points Brought Out in the Discussion.

Tables and seating capacity.—Are square or round tables best? A table 4 feet square will seat eight persons and a round table 5 feet in diameter is best for the same number. Forty-two inches diameter is as small as is comfortable for four persons. Legs should be placed far under, as in the Lake Placid Club tables. Tablecloths may be had in $1\frac{3}{4}$ yards, 2 yards and $2\frac{1}{4}$ yards square, the last being just right for a table seating eight. Cloths larger than this are clumsy and expensive. Bare, polished tables with round doilies have proved very satisfactory at the Lake Placid Club, and at least one dining room at each center is thus equipped. In large hotel dining rooms it is customary to have units to form any combination of numbers. Square or oblong tables are best against the walls and round ones in center rows, if mixed. This is now a popular custom. Eight is considered an ideal number for a congenial dinner party where conversation may be general.

The Women's Educational and Industrial Union, of Boston, allows 10 square feet to a person, including aisles and tables, but this is too crowded. Fifteen square feet is usually considered ample, but the Lake Placid Club figures 16 square feet for liberal space including sidestands.

A Rochester hotel has a kitchen 20 x 48 feet in size, and a dining room 40 x 100 with no connecting pantry. Three hundred are served and nine people do the work.

Fireless cookers for large institutions.—Miss Van Rensselaer remarked that "the fireless cooker saved our lives when we had to serve 450 people with luncheon last week with very small equipment." General Sharpe¹ experimented with large fireless cookers to give

¹ Rpt. Commissary Gen. [U. S. Army], 1909, pp. 11-15.

soldiers hot meat in camp without fires, and also getting rid of stale odors. Those larger than the 78 gal. size are not practicable. Some home-made cookers, like Miss Bevier's, which uses an oven of sheet iron covered with asbestos, and with gas to start the cooking, answer every purpose.

All labor-saving food machinery must be carefully sterilized. Ptomaine poisoning is due to careless service as much as to poor food. It was suggested that we might cook with a coil of steam or electricity around the retainer, to overcome the difference between the top and bottom heat. We need physicists in colleges to study these problems of air space, heat, etc. General Sharpe reports every year and will gladly answer questions. He also has field ovens for baking bread for the army.

Regarding at what point it pays to equip with live steam and labor-saving machinery, it was stated that they are needed for over 100 but at least 200 are needed to make them pay. Small groups of from 50 to 60 are better handled with women cooks. With over 100, men cooks are considered necessary. Special education is required to use all this equipment and machinery.

Wellesley College, in all houses with 100 students, has live steam and appliances, and steam cookers are in all kitchens for over 50 students. There are two cooks in the main building, and in Stone Hall for 120 students. In 14 dormitories there are women cooks.

In the Minnesota College of Agriculture the meals average to cost 7 cents each per person. Board, room and laundry are \$12 a month.

It was announced that Professor Lynde of Macdonald College has now in press a book on Household Physics. At Cornell the professor of physics is to coöperate with the Home Economics department.

Mrs. Mary H. Moran remarked that it is very expensive to handle small numbers with power equipment. The best plan is to have one kitchen for common needs, where soup stock, bread, ice cream, cake, pies, etc., are made and distributed to other centers. Through the Women's Educational and Industrial Union in Boston, some 4000 children and 2000 adults are served with luncheon from the New England Kitchen. Much mince meat is used and the electric grinder is taken apart every night by the janitor and sterilized. It is very difficult to handle.

Miss Corbett also favored one central kitchen for economy.

A Lunch Room for Working Girls, in Which Simple Instruction is Given.**KATHERINE LAGE.***Manhattan Trade School, New York City.*

From the opening of the Manhattan Trade School for Girls seven years ago, the need of a simple lunch was apparent. For this purpose the basement of the school was fitted up as inexpensively as possible. At first, only cocoa, milk and soup were served, the remainder of the lunch being brought from home.

During the financial depression of 1908 a room was opened for unemployed women who were in need of a hot nourishing meal. With limited equipment it seemed almost impossible to meet this demand, but the need was so great that even with no funds available, it was decided to make the attempt.

Daily cooking having been established, it seemed a good opportunity to teach the preparation and serving of nourishing foods. That there is a great deficiency among the girls along this line may be readily seen by observing the lunches brought. These consist chiefly of food purchased from the baker and fruit from the push-cart, unattractively and carelessly wrapped, with little or no thought as to its nutritive value or the needs of the individual. Girls coming from some of the better homes, where money is freely spent for food, are often insufficiently nourished because of a lack of knowledge as to what should be purchased. This we are trying to overcome in our instruction and through the child to reach the parent, that when these girls become home keepers better served, better selected and more nutritious food may be the result.

In 1908 the first cooking class received instruction from a teacher of experience, an auxiliary of women having been formed to carry on the work. Through voluntary contribution they had secured sufficient funds to add to the limited equipment already installed, which consisted of a two-section gas range, instantaneous waterheater, refrigerator, cupboards containing inexpensive china, a menu board, tables and benches, with such cooking utensils as are found in the simplest homes, but really nothing that would be called cooking school equipment.

To many this lack of individual equipment would seem the greatest possible obstacle, but it has its advantages. Most of the girls come from homes furnished with only the barest kitchen necessities. They

learn here that it is possible to cook appetizing, nourishing food with few utensils and that "necessity is the mother of invention." Thus, two groups of girls each wanted a small double boiler. Our cupboard contained only one. The group not securing it was in despair, but with a little assistance they learned to make one from kettles of unequal size. One girl remarked that she was very fond of chocolate pudding such as we make, but she had never been able to have it at home because the double boiler was lacking. Now the problem was solved.

The girls have been enthusiastic about the lunch room from the first and seem greatly to enjoy the simple menus offered. They soon learned to distinguish between our food and that from the corner grocery. The social side, long recognized as a means of development, also appeals to them. They enjoy coming together as one great family where they can have more freedom than in the class room. The lunch room is not large enough to accommodate the whole school, so the girls have been divided, each section coming first for a week.

No article is sold for more than three cents and we try to meet the needs of the students and at the same time serve variety enough to prevent them from buying the unwholesome food from the delicatessen stores.

How well we have succeeded the receipts indicate. They have increased three-fold since the inauguration of regular cooking. Very few now bring lunch from home.

We always serve soup, cocoa, milk, one or two hot dishes, bread and butter, beef sandwiches, two kinds of cake, two or three desserts, with one cooked fruit and two varieties of fresh fruit.

A menu with the cost of each article is placed in a conspicuous place where it may be read before passing to the counter where all cold foods are arranged. The hot dishes are served by members of the cooking class with one paid helper. That the choice may be wise some one is always present to guide in the selection of foods. On the girl's way to the tables the cashier must be passed, then she may sit at any vacant place and enjoy her food and her friends. When lunch is over she brings forward soiled dishes, napkins and refuse and deposits each in receptacles conveniently placed, leaving the table as she would like to find it.

Not all of the girls can take the cooking owing to the limitations under which we are working, therefore selections are made upon the following basis: First, those who are physically deficient either from

a wrong selection of food or from insufficient supply of the proper kind; second, those girls who are home keepers either on account of the death of the mother or her inability to take the responsibility of the family; third, those who can remain long enough in the school to complete the trade work and the cooking as well.

A course of thirty lessons is given, one each day until the course is completed, thus giving them nearly as long a course as the public schools with the advantage that mistakes and acquired knowledge from the previous lesson are still fresh in memory.

Most of the food prepared is sold from the lunch counter, but each day something is cooked to be served immediately. This is very welcome to those who have come with little or no breakfast.

The girls enjoy cooking in large amounts chiefly because they feel they are doing something really useful. They also enjoy the commendation of their friends or classmates who are sure to inquire what girls made the dish which has specially pleased them.

Emphasis is also placed upon such food as they might prepare in the shop or factory where a kitchen is supplied for the use of the workers.

Members of the cooking class come to the lunch room at 12 o'clock, assist in preparing food, arrange tables, and take accurate account of the articles sold. These girls do not pay for their lunches and are not limited in their selection except as to desserts. For many this is the only hot meal they have during the day. Suggestions as to table manners are here made.

One of our difficulties has been to create a desire for wholesome foods with which they are unfamiliar. The girls are encouraged to sample such food each time it appears on the menu and soon a liking for it is acquired. For those not in the cooking class we have instituted a system of tasting to create a desire for some food which has not yet become popular. It is not strange, when they have so few pennies, that they should always choose things they have tried. In like position we, too, would hesitate to spend our all for food we did not know.

The ability to cook independently is tested when they are required to prepare food at home for exhibition. In most cases no assistance can be obtained from the mother because she has not the knowledge to impart. When it seems necessary, materials as well as utensils are furnished.

Many gratifying requests for recipes come from the parents. Many

are of foreign birth and are not accustomed to our great variety of foods. They are also much handicapped because they know neither the spoken nor written language. When the daughter has had her instruction in cooking she takes her recipe home, translates it into her mother's language and thus our instruction is passed on, making many a family happier and better.

Often the girls have trouble with recipes, the simplest language proving an enigma. In one case a recipe had been taken home and the following morning the meaning of the word 'scald' was asked. The dictionary had been consulted but the word found meant something about liquor, and this of course did not help. When questioned about the use of the word the girl said it was in a recipe I had given her. The directions were "to scald the milk."

The principles of table setting are also taught. To the uninitiated this may seem a simple and easy lesson but in several cases it required repeating seven or eight times. This is not strange when we look into the family life and discover that in many homes no table is set, each member eating what he can find when he feels so inclined. In other instances pennies are put in a convenient place for purchase of food when the pangs of hunger annoy.

The final lesson is a breakfast or luncheon to which some of the teachers and auxiliary board have been invited. Each girl prepares and serves some part of the meal.

Our lessons do not always come in logical order because the demands of the lunch room must be met. I have often been asked what we do with food values. We do all that we possibly can, depending somewhat upon the class. Many in a class recently completing the work did not at the start know cinnamon, nutmeg, or soda under any name nor even the names of the simplest cooking utensils. Upon inquiry it was found that the mothers in these families were the wage earners and had little time or inclination to cook a meal after a day of strenuous work. Classes like this have been given a few more weeks of cooking to insure sufficient knowledge to be of assistance in the home. With many this is the only knowledge they obtain until they are established in homes of their own and we hope it will serve to make them better and more capable home makers.

To provide food for small cost and have it both nourishing and palatable, something of food values must be known. The inexpensive materials such as could be purchased in the average family are studied, and simple, well-balanced menus are considered. More than this we have been unable to do.

All through our work we have kept ever in mind the thought of some time being able to teach domestic service as a trade, but as yet our hopes have not been realized owing to lack of funds to promote the work.

DISCUSSION.

It was asked whether instruction in domestic arts should be insisted on in vacation schools? And can these domestic arts be taught as a trade?

There is much trouble in some schools because teachers are so often tactless. One said to a pupil: "You are too nice a girl to wait on table, you don't have to earn your lunch." This feeling spread through the school and it was almost impossible to get waitresses. Boys are used in some schools.

When Macdonald Institute opened, it was thought the chief end of a girl was to learn to cook. If visitors came and a girl was cleaning, her first impulse was to run to cover. Now there is no trouble, rich girls working side by side with the poorest. At first the girls fought against housework but now they are proud of it. Canadian high schools were started with volunteers and there is no trouble in getting waitresses or girls to wash dishes.

Nutrition Investigations in Relation to Dining-Room Management.

C. F. LANGWORTHY.

Office of Experiment Stations, United States Department of Agriculture.

The paper here summarized outlined some of the conditions which must be met if the diet of the institution, *i.e.*, the group living under more or less uniform conditions, is to be reasonable and rational as well as palatable. Economy in purchase, storage, preparation and service are desirable. Cleanliness, which is truly applied hygiene, not merely the following of tradition, is vital, and if the problem is to be rightly solved, age, sex and activity must be considered in fixing upon food supply, that is material to build repairs and run the body machine.

To do these things and have the result a pleasing dietary is no easy task, but it can be done. Here, as in other matters, knowledge and wisdom both are needed. Scientific studies of food composition, of

Summary of Dietary Studies in Public Institutions

LOCATION AND SUBJECTS OF STUDIES.	NUMBER OF PERSONS IN STUDY.
Bayview, Baltimore; regular inmates, males.....	136
Chronic inmates, males.....	82
Receiving ward inmates, males.....	82
Average of 3 studies.....	
Women inmates, per woman per day.....	111
Women inmates, per man per day basis.....	111
Average of 4 studies.....	
Aged Women's Home, Baltimore; per woman per day.....	76
Aged Men's Home, Baltimore; per man per day.....	48
General German Aged People's Home, Baltimore; per man per day...	70
Asylum for Indigent Widows and Single Women, Philadelphia, per woman per day.....	113
Government Hospital for Insane; patients, males—middle to old age	
Largely chronic, orderly, quiet, few workers; average of 10 studies	952
Acute, nervous, disturbed, non-workers; average of 3 studies	94
Negroes, whole group.....	169
Negroes, non-workers.....	89
Negroes, workers.....	80
Sick, infirm, bedridden; average of 2 studies.....	166
Younger and more active class, some curable, part workers; aver- age of 2 studies.....	59
Better class, on first section diet; average of 2 studies.....	22
Unclassified; average of 2 studies.....	127
Average of all patients, New York State Hospital for the Insane:	
Patients, males—Chronic, infirm; average of 8 studies.....	1069
Light workers and disturbed; average of 2 studies.....	318
Workers, average of 10 studies.....	1595
Restless, active, disturbed; average of 2 studies.....	258
Acute, recent admission; average of 2 studies.....	70
Acute and sick, chronic; average 2 studies.....	35
Alms-house, Baltimore 1852—non-workers:	
Workers.....	
Long Island Alms-house and Hospital, Boston.....	
Charlestown Alms-house and Hospital, Boston.....	

in the United States. (Quantities per person per day.)

NUTRIENTS AND ENERGY.

In Food Eaten.		In Food Wasted.		Proportion in Food Wasted.	
Protein, Grams.	Energy, Calories.	Protein, Grams.	Energy, Calories.	Protein, Per Cent	Energy, Per Cent.
144	2901	4	97	3	3
93	2016	2	45	2	2
111	2274	1	11	1	—
121	2504	3	59	2	2
85	1924	6	134	7	7
106	2405	8	168	7	7
113	2414	4	84	3	3
85	2206	12	308	14	14
83	2339	9	304	11	13
74	2225	8	265	11	12
58	1882			8	8
88	2767	13	341	13	11
84	2599	22	567	21	18
98	2536	12	315	11	11
90	2402	12	306	12	11
108	2694	13	319	11	11
97	2519	34	802	26	24
104	2917	12	256	10	8
125	3398	29	753	19	18
76	2609	18	539	19	17
90	2704	16	415	15	13
72	2259	4	90	5	4
73	2255	4	94	5	4
105	2908	7	132	7	4
95	2665	6	142	6	5
65	2477	7	161	9	6
66	2432	4	94	6	4
78	1959				
85	2057				
109	3164				
71	2415				

digestibility, and of other factors are furnishing a fund of fact. Knowledge can be gained. Wisdom comes with experience. The data now at hand make it possible for the nutrition expert to do for the institution food problem what the trained expert can do for any other business organization; that is, insure better conditions, better service, and greater satisfaction for all concerned, both the management and the persons provided for.

As an aid in institution work a score card is suggested, in which the various factors to be considered are given a theoretical rating, with which conditions as they exist may be compared as a basis for change or for making sure that a standard is kept. This score card, which was offered simply as a basis for discussion, follows:

Dietary Score Card for a Public Institution.

FACTORS.	MAXIMUM VALUE.	RATING.
	<i>Points.</i>	
Quality of food	25	
Adequacy of food.....	25	
Economy of food, <i>i.e.</i> cost as compared with income	20	
Cooking, serving and palatability	10	
Cleanliness in kitchen and dining-room	10	
Attractiveness of diet	10	
Total	100	

A large number of dietary studies in public institutions have been made in the United States, particularly in connection with the nutrition investigations of the U. S. Department of Agriculture.¹ The table given on pages 530 and 531 summarizes the results of American work of this character.

Some results of dietary studies with individuals in public institutions in foreign countries are summarized in the following table:

¹ United States Department of Agriculture, Office of Experiment Stations, Buls. 150, Dietary Studies at the Government Hospital for the Insane, Washington, D. C.; 223, Dietary Studies in Public Institutions in Philadelphia, Pa., by Emma Smedley and R. D. Milner, and Dietary Studies in Public Institutions in Baltimore, Md., by H. L. Knight, H. A. Pratt, and C. F. Langworthy.

Suggested Dietary Standards for Aged People.

(Quantities per person per day).

SUBJECTS OF STUDIES.	NUTRIENTS AND ENERGY IN FOOD EATEN.	
	Protein.	Energy.
	Grams.	Calories.
Voit:		
Old man, no work.....	90	2116
Old man, light work.....	100	2689
Old woman, no work.....	80	1831
Old woman, light work.....	85	2096
Old people, hard work.....	100	2898
Maurel, maintenance rations:		
Men, 60 yrs., average weight, 145 lbs.....	82	1965
Men, 70 yrs., average weight, 139 lbs.....	79	1891
Men 80 yrs., average weight, 134 lbs.....	46	1531
Men, 90 yrs., average weight, 128 lbs.....	43	1446
Women, 60 yrs., average weight, 125 lbs.....	71	1702
Women, 70 yrs., average weight 119 lbs.....	67	1612
Women, 80 yrs. average weight, 114 lbs.....	39	1288
Women, 90 yrs., average weight, 108 lbs.....	37	1234
Atwater:		
Man without muscular work.....	90	2450
Man at sedentary work or woman with moderately active work.....	100	2700
Man with light to moderate muscular work.....	112	3050

In discussing the dietary standards suggested for aged persons and children as a result of the recent United States Department of Agriculture investigations, the dietary standard for a man in full vigor at moderate muscular work is taken as a unit. It must be remembered in all such discussions that a dietary standard is simply a guide for home and institution management and is not to be considered as an expression of absolute physiological requirement. The dietary standard suggested by the Office of Experiment Stations for a man in full vigor at moderate muscular work follows, the data being given on the basis of food purchased, food eaten, and food digested:

United States Department of Agriculture, Dietary Standard.

(For a man in full vigor at moderate muscular work).

KIND OF FOOD.	PROTEIN.	ENERGY.
	Grams.	Calories.
Food as purchased.....	115	3,800
Food eaten.....	100	3,500
Food digested.....	95	3,200

The relative amounts of food required by persons of different age and occupation as compared with a man in full vigor at moderate work, as determined on the basis of the work of the Office of Experiment Stations, are shown in the following table:

Relative values for food requirements of persons of different age and occupation as compared with a man in full vigor at moderate work.

Man, period of full vigor:

At moderate work.....	100
At hard work.....	120
At sedentary occupation.....	80

Woman, period of full vigor:

At moderate work.....	80
At hard work.....	100
At sedentary occupation.....	70

Man or woman:

Old age.....	70-80
Extreme old age.....	90

Boy:

15 to 16 years old.....	90
13 to 14 years old.....	80
12 years old.....	70
10 to 11 years old.....	60

Girl:

15 to 16 years old.....	80
13 to 14 years old.....	70
10 to 12 years old.....	60

Child:

6 to 9 years old.....	50
2 to 5 years old.....	40
Under 2 years old.....	30

As a part of the discussion following the paper, Dr. Langworthy pointed out that an institution may be defined as any group of persons

fed under uniform conditions, as in the army and navy, the population of almshouses, prisons, asylums, and other public institutions, and the groups in boarding houses and hotels. The well trained dietitian must know the amount of food required and the dietary standards for persons of different age and sex and with different muscular work and environment, and must also know about food composition, shrinkage in storage and preparation of food, and similar matters. Kitchens must maintain standards of cleanliness and it is a prime requisite that an institution shall provide a reasonable amount of food suited to the needs of the group fed.

Both overfeeding and underfeeding must be avoided. The energy requirements of man at work or at rest are reasonably certain, but the exact amount of protein needed is still more or less a matter of opinion, though information is accumulating rapidly. Much of the discussion about this matter is due to the fact that persons do not distinguish between physiological requirements and dietary standards, the latter being simply guides for home and institution management. Another source of confusion is the failure to distinguish between standards expressed on the basis of food purchased, food eaten, and food digested. These factors are taken into account in the dietary standards recently proposed by the Department of Agriculture, and which it is believed it is safe to follow at present. As noted in the above paper, these call for 118 grams protein and 3,800 calories of energy per man per day in the food purchased for a man in full vigor and engaged in moderately active muscular work. If considered on the basis of food eaten, the amounts are 100 grams protein and 3,500 calories of energy, and if considered on the basis of food digested, 95 grams protein and 3,200 calories of energy are called for.

As an illustration of the importance of applying knowledge to institution problems, Mrs. Abel's work in Baltimore may be mentioned. Some years ago she made a very careful study of the food problem at Bayview, the city almshouse, and as a result suggested a diet which was ample as regards protein and energy, reasonably palatable, and cheap, since it cost only seven cents per man per day. To insure palatability many expedients were resorted to, such as serving meat dishes in which the meat was browned instead of always serving soups and stews, which is a common custom in institutions where low cost is necessary. The use of cooked cereals at breakfast in place of bread made little difference in cost and was a very acceptable addition to the diet.

Investigations in public institutions show that there is great need for the use of scales and for checking weights in institution buying, or one may pay for 100 pounds and get much less. In one case it was found that a wholesale firm which on a large order for choice cuts of meat made a price three cents a pound lower than a competitor, supplied material which was twenty-five pounds short in weight. No one would contend that the majority of dealers engage in such practices, but it is always well to check up purchases at frequent intervals.

In the course of the discussion, it was pointed out that score cards similar to the dietary score card suggested would be of great value in all departments of institution work. Score cards should be posted in kitchens and in such cases should cover the problem of sanitation, including hygienic construction, and should especially emphasize keeping out all flies, which are apparently much more dangerous even than dust and visible dirt. Score cards should be made to apply to the quality of various kinds of food and to cooking. They may also be used to help the visiting dietitian as well as the institution manager. If a poor woman has five dollars a week to spend for food for her family, how much is she justified in using for certain kinds of food? Cannot the Conference help in this work? Manuals are needed as well as score cards. It has been suggested that an excellent way of teaching the use of the score card would be to have score card parties in which guests were invited to score the house where they were entertained. Miss Hunt is responsible for this idea. Miss Alline has devised score cards for use in the work which she has carried on under the New York State Board of Education in visiting institutions for trained nurses and considers them among the first necessities of her work. Such score cards would lead to better inspection systems in many lines. At least one city in the United States has adopted dairy inspection based on score cards. They could readily be applied to inspection work in bakeries and other places where food is prepared and in general to judging of the cleanliness of all kinds of work which pertains to the home.

As regards hygiene of food, too much insistence cannot be made on decent methods of handling, preparing and serving it. Mrs. Abel says that the problem of clean food is chiefly the problem of clean hands. In designing plans for public institutions basement kitchens below the level of the sidewalk or road should be avoided. It is almost impossible to prevent dust blowing into such kitchens in clouds.

The question of teaching table decorum in public schools was also considered, more especially with reference to such groups as students in college clubs and boarding houses. It was pointed out that there are in vogue in the United States two customs of decorum at table, each of which has its advocates, some persons preferring to follow English customs and others French. The English use the knife in the right hand and the fork in the left, while the French use the fork in the right hand with a piece of bread in the left. Students very generally need instruction in table usages and customs, and experience shows that it is much better to make suggestions regarding table manners before the teachers have watched the students at the table, as then the suggestions will not be regarded as individual criticisms. Table customs change. As an illustration, it was fashionable a hundred and more years ago to drink from a saucer and the use of the knife for conveying food to the mouth was not a breach of good manners, but a custom which has come down from a still older time when forks were unknown or very rare. The teacher should endeavor to instruct her pupils in what is considered good usage and in all the ordinary matters of table manners, but should also emphasize the unimportance of fads in table service and in table utensils and decoration. Here, as in cooking and serving food, the reasonable and rational should receive attention and not the useless or trivial.

Courses of Instruction in Laundry Management.

L. RAY BALDERSTON.

Teachers College.

"The world gives its admiration not to those who do what nobody else attempts but to those who do best what multitudes do well." These words of Macaulay have been our laboratory motto this year. We felt it a good motto because we knew that as far as laundry work, from its old standpoint, was concerned, *many* did good work but *we* wanted to do the best work.

No department of an institution requires more organization and care than the laundry. Visitors ask, why put the laundry course in the school or college curriculum? What will the students ever do with it? Just where does this course come in? What will these women do when they leave here?

Our answers are numerous. Any school teaching household arts could not possibly do complete work and omit laundering, an art so essential to all members of the household. Every woman knows that a large part of many women's lives is spent at the wash tub. Why not know the easier and better way for herself, or know how to teach it for better results from her workers? Physical energy, mere human power so often expended in laundry work, is wasted to a great extent, and could be used to better advantage in saving time for other duties or pleasures. To quote Professor Ruediger, "Every profession is based on a number of pure sciences that must be mastered," and again, "Every profession requires systematic training and practice under guidance." The art or profession of laundering does not differ from other professions.

With the growth of flats or apartments, hospitals 6000 strong, and schools and colleges, the demand for proficient head-workers should increase. These institution laundries should be presided over by a trained worker, while the commercial or community laundry (for such we may call the apartment house laundry), and we cannot omit the little basement laundries under stores, should be inspected as to their sanitary conditions and their use and abuse of clothing. Trained women as inspectors should, and in time will, play a very important part, I believe, in the licensed laundry.

Every institution meets an heroic problem as to time, labor and expense in the fact that no institution can be properly conducted without an ever-ready supply of clean linen. The washing of this linen must be done as cheaply as possible, and at the same time quickly and well. The institution owes to the church, society, the community, or to the State which gives it birth, a practical and economical solution to its management problem. For some time past the trained worker has supervised buying supplies, cleaning, and repairs, while the expert dietitian has planned and watched the food purchased and prepared, has prohibited waste, and overseen all the culinary activities. This has all meant economy. Why should the laundry department be left headless or with a head who is appointed, it may be, through friendship or political favor, and who is without knowledge or, worse still, without principle? The time has come when the sad mistakes from such appointments are being appreciated and when it is becoming evident that expert knowledge or practical and scientific training are indispensable to the successful management of a laundry.

A natural consequence is the increasing demand for trained heads of laundries or qualified assistants, and resulting from this, a school where managers, superintendents and instructors are taught. Knowing the demand and foreseeing the vastness of the work, a course was opened last fall in Teachers College, Columbia University, under the department of household administration.

In the new household arts building a laundry laboratory was planned where instruction might be given in domestic or home laundering, and in institution laundering. This room is 40 x 28 ft. and by the arrangement of domestic and institutional equipment has been divided in half. The floor is of white two-inch hexagonal tile, with a sanitary curved base of tile. The pitch of the floor is such as to insure rapid and complete drainage to an outlet under the stationary tubs. A five foot wainscoting of white tile and light cream colored enamel paint form the wall, while white enamel paint finishes the ceiling, making an entirely waterproof room.

It seemed wiser to have one laboratory accommodate the two types of classes, so some of the equipment is more or less interchangeable. The twenty-four stationary porcelain tubs, placed in two rows, occupy the middle of the domestic half of the laboratory. These tubs have been set higher than the usual plumber's standard, and we find thorough satisfaction results, as the washers keep drier and there is much less back strain. I heartily believe in the higher wash tub. To have this height a tub must be chosen with gas pipe legs. Our tubs are smaller than is usual because they were to be used as laboratory tubs where a number of students work at a time, and consequently the smaller tub economized space, and again the wash of each student in practice is smaller than the home wash. Each tub, besides being piped with hot and cold water, has an "L" shaped nickel steam pipe which permits the tub being used as a boiler.

This equipment is quite possible for apartment houses or flat houses where a central laundry is used by the renters, and by small institutions where body work only is done, because the small quantity of soiled clothing does not warrant power machines. With 100 lbs. pressure of steam a tub full of clothes may be boiled in five minutes. A little care will eliminate the only disadvantage resulting from these steam pipes, and that is to allow a clear passage of steam through the pipes and thus drive out any rust that may form. Brass piping is a sure way of preventing the formation of rust, but its cost is almost prohibitive.

Ten ironing tables of the commercial type have been placed along the window side of the room, a blackboard being on the opposite wall. We have gas and electric heated irons. Electric irons weighing eight pounds and with a light attachment at the switch do work well if care is used.

While this equipment seems to be entirely for teaching the domestic laundry classes, it is so much a part of the outfit for the institutional classes that a description of the laboratory would be incomplete without it.

The institutional machinery is of the American type, and has been chosen to represent such machines as are necessary for every steam laundry plant, the size, number and variety being a matter of conditions. The washing machine is of 100 shirt capacity, with a galvanized iron outer cylinder and brass cage. The 20-inch extractor, the 75-inch return mangle, the two-section cabinet drier, the starch kettle, and the soap tank constitute the stationary equipment. A $7\frac{1}{2}$ h.p. motor runs this apparatus at a cost of 5 cents an hour. This cost is high, as more work could be done and the electricity more economically used. The machinery was chosen in a small size because of the original cost, but more than all with the idea that the small equipment would teach all that a larger one could. The cabinet drier was selected over a conveyor because of the varied type of work, and again because this cabinet must answer as a drier for the domestic classes.

The time given during the last year has been three consecutive hours a week. The class averaged 12 members, composed of graduate nurses and of those training for institution management or for teaching. I believe a course in domestic laundry should precede the institutional. About 40 minutes each day was given to talks on types of laundries, types, use and care of machinery, methods of marking, removal of stains, division of labor, and similar topics.

Each lesson had some practical work in the washing, extracting and mangling of flat work. No hand-ironing was done by the institutional classes. About 200 pieces a lesson were asked for from the dormitory or gymnasium. Owing to the number of students, it was necessary to divide the class work—those washing one week, mangling the next. At the close of the lesson period the finished work was ready to go back to the sender. The students at all times were responsible for the greasing or oiling of machinery and timing water changes, and each had some practice in all lines of the work. I believe the practice was sufficient to make the student feel that she had the main

preliminary knowledge necessary to work quickly into the larger field. We know every hospital or institution has its own problems of the division of the day's work, division of the help's work, and cost, but these, I believe, cannot be laid down by any rules other than to present different outlines of work from different institutions as a working basis.

As in any teaching or hospital training work, the students visited large commercial laundries to see various and improved types of machinery. These outside visits have great advantages in showing ideas of sanitation, in arrangement of rooms, type of helpers, and differences in the consideration given to the helpers.

In this connection I must speak of the welfare work done in the Pilgrim Laundry in Brooklyn. Miss Jane Seymour Klink is employed as the welfare worker in this commercial laundry and her work is largely from the social and ethical side. While knowing the proportions of starches and blues and the work they should do if rightly used, it is her special function to know the girls in all departments. She it is who encourages saving by the Penny Provident Fund, and who acts as cashier. She it is who attends to aches and pains, each time making a record of medicine given and the amount; she it is who knows where her girls go on a vacation or why they are away from work. A small circulating library in her little office is for all. A hot substantial addition to the day's luncheon is prepared under her guidance at a cost of from three to six cents, the workers bringing from home the bread and butter to lessen the cost.

The lot system is employed. Cards are sent out to all departments saying it is a 10 or 11 lot day, and each lot of clothing is put through its various stages by the time card. If the lot is finished ahead of time, the time between lots may be used as rest or relaxation time. In this laundry the worker is never too busy to measure the water in the gauge, never too busy to set his time clock, telling him accurately when to make the changes, never too busy to measure soaps or blues. A paper, *Pilgrim's Progress*, is published monthly. Some of the workers in the laundry act as editorial staff, and the paper reports the general activity as any society paper might tell of the life of its subscribers. As a part of the club idea, every employee wears a pin, from which a small silver numeral hangs which tells the number of years of service.

I have spoken at length of this commercial laundry in order that I might show distinctly the kind of work that may be done in business establishments, but is not often done.

To return to the work at Teachers College, the students are asked, besides the visiting, to work along research lines, and are given special subjects.

So much for what we have done, and now a few of our desires for the future. Soon one division will be too large; when we have more it will be possible to do shift work. This will represent the day's work better, in that the morning class can start certain large pieces of work and the afternoon class can finish, making it possible to do more work, and longer and more detailed problems. We can work out the problem of the best washing machine. We can prove if the wash wheel is all the sterilizer needed. We anticipate the time when the course extends during the whole year and the students of the second term will act as managers and supervise or direct the work of the juniors.

With either of these two advances it will be possible to do test work, such as analyzing blues, soaps and waters to the point of feeling familiar with the question, and at any time being ready to detect inferior or adulterated goods. Again, it will be possible to experiment with the effect of bleaches. One marked set of clothes can be washed with bleach each time, and another, by way of comparison, having no bleach. The goods must be purchased at the same time, be of the same quality, and be kept until worn beyond use that the comparative effects may be studied.

Should it not be possible for the students to go to a special department and study, I believe the nurse, for example, could take one month in the laundry, as she does in the diet kitchen, and each week work out some special problem. The institutional worker in training might apprentice in some institutional laundry where good work is done. We are just beginning on this new career, this new type of work in the laundry world, and while we may have many theories that may not succeed, they cannot help but lead to the way for better work, done in a sanitary, scientific, practical and economical manner.

What should we ask for? A person at the head of every laundry department in every institution who has made the matter a study, whose word is taken as authority, whose scientific research can be proved, whose interest is a live one for the good of humanity in the laundry by providing healthful, well ventilated work rooms, wash rooms as well as ironing rooms, far from dark, damp and poorly ventilated cellars. We would also ask for better pay, so that the piece worker no longer need crouch over his iron and work as if hounded and probed by the prongs of the evil one.

We would also ask for an interest for humanity *outside* the laundry, shown by placing at the head a person with a knowledge of popular methods of washing, proper proportions of soap and water for clean clothes, the best kinds of soaps, and a knowledge whether they are loaded with surplus alkali or weighted with rosin. We would ask for a person who knows the best blues and whether they are made of iron compounds, which break up in the presence of alkalies, depositing the iron spots so often laid to the rusty nail or boiler; or whether the blue is made soluble by acids, or weighted with sand, which can never make any clothes blue. We would ask for a person who knows the use and abuse of bleaches, their necessity or their uselessness; who knows the various fabrics, their structure, their dye, and how they may be cleaned to the best advantage and so save color and texture.

We would ask for a person who knows enough of chemicals to make them of the most help in setting colors and in removing stains and still do little harm to the fabrics. We would ask in fine for a person whose scientific principles will go hand in hand with practical knowledge and personal exertion.

Equipment for the Small Institutional Laundry.

CLARA D. NOYES.

St. Luke's Hospital, New Bedford, Mass.

Location.—When building an institution laundry choose its location with relation to light, sunshine and a free circulation of air; preferably a separate building if there is sufficient space. The top floor of a building is the next most desirable location. A basement laundry is very undesirable; examples of such can be studied in hotels and many commercial laundries.

Construction.—The architectural lines of the main buildings should be maintained when building a laundry. It should be harmonious architecturally and a pleasing feature of the institution. The main points to consider in construction are first durability, second simplicity, and third convenience.

Durability.—Only those materials should be chosen which will prove durable and lasting. The walls should be of a hard, impervious finish, white or pale cream in color. Hard plaster, although providing an impervious finish, chips, cracks and breaks, and requires frequent

painting. The glazed brick makes a good partition and outside wall and furnishes all the features desired. It is more expensive to put in, but cheaper in the end, does not chip, crack or break and presents a smooth, impervious finish. Tiled walls are also very beautiful but are not so serviceable as the glazed brick. Floors should be of granolithic or tiling, as these are easily kept clean, are non-absorbent, and are far more sightly than other floorings.

The ceiling of metal, painted in white or cream enamel, is durable and clean. Sheathed partitions and walls are dangerous and unhygienic, and unless painted in white enamel make the laundry dark.

Simplicity in arrangement and construction are the next points to consider. Avoid closets and dark corners, broad window ledges and panelled doors. Endeavor to reduce the opportunities for the collection of dust to a minimum, thus avoiding extraordinary outlay of labor in keeping the laundry clean. Simplicity in construction, arrangement, and equipment naturally implies less work and fewer workers..

Convenience.—In arranging the floor plan, great attention should be paid to the question of convenience. The soiled linen should pass in regular order from the receiving and sorting room to the wash room, the extractor, the shaker, and the dryer, in turn.

The ironing, mangling and body ironers should be arranged with the greatest care to save steps. The ironing boards should be sufficiently near the body ironers to be reached easily. The irons, heated in whichever way is most expedient, should not require a single step out of the way. If gas-heated, provide each ironer with her own gas stove at the end of the ironing board. It is a great waste of time and strength to require ironers to walk to the next room every time they require a hot flat-iron.

From the ironing room the linen should next pass on to the sorting room for clean goods. The more thought displayed in the question of a convenient arrangement of ground plan, machinery and general equipment, the greater saving in the end.

After the laundry has been located and built, the question of equipment must be studied with regard to the peculiar needs of each institution. The number and size of the pieces of machinery depends entirely upon the size of the institution and the daily average number to be kept provided with clean linen. No unnecessary pieces of machinery should ever be introduced, and every piece installed should be in constant use and give good returns, *e.g.*, it would be extremely extrava-

gant to put in collar and cuff machinery or shirt ironers if there are only a few men to use such pieces of linen.

It is wise to select the machinery from a dealer close at hand. In case of repairs or breakdowns it is much less expensive than to be obliged to send off a long distance for parts of a machine and less time is wasted in waiting.

The only safe way is to begin by making a careful study of other laundries, both institutional and commercial. A great deal can be learned from the latter. As the commercial laundry is equipped to make money, great attention is paid to the choice and selection of machinery, and only that which will give the best returns in well finished quick work at the least outlay of money and force to operate is ever installed.

Arrangement.—The position of the various pieces is important. They should be placed at a sufficient distance from the walls to allow for passing easily back of them. This will permit cleaning, and also keep the walls cleaner. It applies to set tubs as well as other equipment. The washers, tumbler or shaker, and soap tank should be placed in line, the extractor in front of the washers, and the set tubs near the washers. As the dryer will be needed after the tumbler, it is well to have it quite near. If an engine or motor is used it is just as well to have it in this room unless it is placed in the engine room. The starch kettle should be near the set tubs, although a separate room for starching is sometimes recommended as a matter of cleanliness. A neat wall-closet near the engine will hold all the supplies necessary for the engineer's use. Another will be needed for the utensils used in blue and starch-making, such as measuring cups, glasses, strainers and straining cloths, pails and dippers. The ironing room should contain all the ironing machinery, mangles, body irons, ironing boards, clothes hangers and horses, with a large substantially made table near the mangle.

The sorting room should contain a large table or counter for sorting and specially planned compartments for nurses,' inmates,' doctors' and helpers' clothing. These must be sufficiently large and plainly marked with a name plate into which a card can be slipped. This is perhaps the neatest method in places where inmates are continually changing.

The receiving room, or room for soiled clothes, should contain suitable receptacles for the various kinds of soiled linen as they are brought in. Large, square hardwood, zinc or metal-lined boxes

afford the neatest method. If these are on wheels they can be transported from place to place.

There should always be a suitable dressing-room with toilet accommodations. This should be fitted with a hanging strip and hooks. A roomy closet for brooms, brushes, and stepladders, also one for laundry supplies, such as soap, starch, soda, or better still, bins of hard wood with hinged covers and with a capacity of one or more barrels, make a much tidier way of keeping supplies than having to store three or four barrels, as the latter take up considerable room and are always untidy. The bins can be placed along the wall in the ironing or wash room and fitted with locks. The principal objection to closets is the difficulty in keeping them clean.

It is not uncommon to see the entire laundry equipment in one large room without any partitions. If such a room is used, the machinery can be quite as conveniently arranged but does not look quite so well. Occasionally two or more stories are used. In such case a lift is a necessity. It matters not so much as to the floor plan, the important point is to arrange the machinery conveniently so as to save time and steps.

List of machinery.—For an institution of two hundred beds approximately the following equipment is needed:

- 2 washers (wooded) 100 shirt capacity.
- 1 tumbler or shaker.
- 1 26 inch extractor.
- 2 sectional cabinet dryers.
- 1 mangle, (100 inch,) with return apron.
- 1 body ironer.
- 4 ironing boards with individual gas stoves or electric irons.
- 1 engine, 12 horse power, horizontal.
- 1 motor.
- 1 starch kettle, steam jacketed.
- 1 starch table, zinc top.
- 1 copper soap tank, 40 gal.
- 6 set tubs.
- 1 clock.
- 1 truck for wet goods.
- 4 ten-bushel baskets fitted with trucks.
- 1 large substantial table for sorting goods from the mangle.
- Several hard-wood clothes horses with casters for sorting goods ready for the mangle.
- Several horses for drying goods ironed by hand.
- 4 hardwood bins for storing supplies.
- 2 wall closets for engineer's supplies and blueing.

The approximate cost for the above is about \$2,000. A floor space of 40 x 60 feet will be required.

This estimate will serve as a basis upon which to figure. The equipment can be varied to suit the needs of the institution, and increase as the institution demands.

The 100-inch return apron mangle is a great labor saver. The return apron requires only two workers, passing a sheet through single or open, and bringing it back perfectly dry. It thus does away with the necessity for airing, thereby saving time and steps, as a sheet can be used at once on a bed. The entire surface of the heated cylinder is utilized, therefore there is no waste of heat or ironing surface. Time is also saved as the workers stand to feed and receive in the same place. The saving is particularly large on small goods, as three workers can kept be busy at the mangle.

In regard to body ironers, it is sometimes difficult to get help to use them or to find capable workers. Some small institution laundries do not install them, but use very generally the Toof Jumbo iron for large surfaces. Personally, the writer believes in the body ironer. If properly used it gives excellent results as to finish. It is very easily learned and with a little patience and encouragement a worker will become quite skillful in a few days.

A great deal could be said about the use and care of these various pieces of machinery, and a few words seem essential. Great cleanliness is very important; the machinery must be kept clean and free from dust and superfluous grease and oil. The mangle and ironing sheets must be clean and free from dust, lint or starch. All machinery should be covered with special sheets when not in use. It must be kept in perfect order and repair and carefully oiled. Valves and joints must be kept tight, otherwise steam will be lost. Water faucets must be tight and the most economical method of heating water devised, otherwise time, coal, steam and water will be wasted.

Great care should be exercised in arranging a careful system as to washing, extracting, etc., otherwise quantities of linen may be ruined.

Good "help" and good wages are economical in the end. Ignorant employees are not only unsatisfactory but a great extravagance.

Careful rules and regulations should be introduced and lived up to. All avenues of waste should be carefully watched and controlled.

The more time and thought spent in studying the laundry question in our institutions, the greater the satisfaction and the keener the pleasure derived from turning out carefully cleaned, well finished linen at the least expense and outlay of time, strength and money.

The Laundry as a Commercial Enterprise.

JANE SEYMOUR KLINK.

Welfare Manager, Pilgrim Steam Laundry Company, Brooklyn, N. Y.

To run any business requires business training and experience—a practical knowledge of practical affairs, a comprehension of the credit system, a capacity for organization, an administrative ability in directing affairs and managing men, an insight into detail, and at the same time a breadth of vision large enough to take in the whole. If one has any talent it needs to be cultivated. Perhaps the talent for laundry work needs more cultivation than others. Nevertheless, if a woman wished to engage in the business of running a laundry, the important question would be "Can I make it pay?"

Every one wants clean clothes and the laundry work is being taken more and more from the home. The initial cost of the plant is comparatively small, the labor being the greatest item to be considered. It might seem that women would be particularly fitted to set and maintain a standard of good laundering because of the long experience which they as a class have had in that occupation.

If a woman intends to go into the laundry business, has she, first of all, the ability to manage people, has she mastered the secret of making men and women not only work, but want to work? Many of the operations in laundering are classed among the unskilled trades, and in the fringe of workers who go from one of these unskilled occupations to another there is not always a marked tendency to work; in fact, if they are eager for a position, they seldom display the same eagerness for work. Has the woman the patience to train them into skilled workers? Has she the masterfulness necessary to overcome petty jealousies, reprove dawdling, weed out those who "soldier," in short, to organize her help into a practical working force where each one does his or her part with ever-increasing efficiency?

Next, has the would-be manager of a laundry clearly in mind a standard of excellence in the work? It is not enough to wash clothes, iron them, and send them home safe. There are many people in the laundry business who are doing that. The clothes must be washed a little better than any one else's or there must be an attempt to excel in some other particular thing. For instance, there was a young banker who never had the neck-bands of his shirts ironed to suit him. Finally, becoming exasperated, he decided that he would start

a laundry of his own and see if he could not have those neck-bands right. That was, perhaps, five years ago. He is still in the banking business, but three large, flourishing steam laundries bear witness to the fact that his standard in neckbands and everything else is high.

To the woman contemplating a laundry business, then, I say, "If you can find some one thing that you think can be improved upon, and you know you can improve it, try that." For instance, if a laundry was started to do fine work in the best possible manner, making a specialty of washing infants' clothes, old ladies' caps, fine lace, delicate underwear, in addition to the regular work, doing all these things well and reasonably, there would be a place for such a laundry in any large city.

In the laundry business there are no "tricks in the trade." It is clean, straightforward work, and for that very reason should be a paying business for a straightforward woman, provided she has the business capacity. But it means work. There are a thousand matters to claim her attention. A knowledge of practical chemistry is of the greatest value. The chemistry of soaps, colors, bleaches, materials, bluing, must be worked out daily and hourly. Absolute cleanliness is a positive necessity, and no pure food law demands more rigorous enforcement than does the law that soap, starch and water must be of the *highest* standard—never causing speck or stain.

One department of a well-regulated laundry, which is as much a part of the business as the washing or the starch department, is the welfare department. This should be on an economic basis, with the distinct understanding that what is of benefit to the employee must be of benefit to the employer, because both are engaged in the common furtherance of a common work.

The welfare manager may not know the kind of starch used, or its proportions, but she must know what kind of work the employee is doing with the starch. She knows whether the employee is falling below her usual standard, and if so, she seeks to discover and remove the cause of her failure. On the other hand, she watches to see whether that same employee, not knowing her strength, overtaxes herself when she should not do so. She may not be able to turn out a perfectly ironed shirt, but if the shirt be not perfectly ironed, it is her business first, to know why it is not done properly, and then to see what can be done to improve and encourage the employee who has slighted her task. It may be that hasty breakfasts or hurried lunches have caused indigestion, therefore the welfare manager takes pains

to have that employee eat a good luncheon, which is provided in the plant at a nominal cost.

It is not that good work is demanded, as it were, but rather that each employee is led to feel that she cannot in honesty give anything else, whether for her own sake, for her companions' sake, or for the firm's sake, because they are all parts of the same thing. For instance, if she stays away others have to do her work, so that a regard for them should bring her in even if her inclination be otherwise. Now "solum nobis" is the motto of the Pilgrim plant, and each one tries in greater or less degree to live up to it. Increase of wages comes whenever, in the opinion of the managing force, it is deserved, and faithful, loyal service brings its own reward in the matter of dollars and cents as well as in each worker's satisfaction in doing efficient, effective work. The idea is to educate each employee up to the highest level of efficiency, because the better work of each makes the more perfect work of all, the little saved by each makes the much saved by all, the profit to each gives the greatest gain to all.

Suggested Linen Standards for Hospitals.

LOUISE POWELL.

Superintendent of Training School for Nurses, University of Minnesota Hospital.

[Miss Powell's careful paper, while based entirely on research work in connection with hospitals, contains several passages which should be of interest to anyone in charge of an institution household. Since it is not feasible to print the whole paper such selections have been made as seem to be of the greatest general value.—Ed.]

There is probably no department in a hospital, whether large or small, concerning the administration of which there is greater variety of opinion and less uniformity of system, than the linen room.

Very few hospitals, I find, are prepared to furnish estimates of the standards in use in their wards, very many have no standards. There is a striking difference in the amounts considered necessary and adequate by the various superintendents.

In arriving at a standard for tea towels and glass towels, a plan was adopted in our hospital which has been tried and found satis-

factory. To each department using these towels, seven are given. These the maid must wash out every day, and at the end of the week they are sent to the laundry, a fresh set of seven being given to the maid. In this way fourteen towels will supply the maid, they can be readily accounted for, and she should always have a supply of clean towels.

If nurses could be made to realize, what is really a fact, that the initial cost of providing only *one* extra sheet and *one* extra pillow-case for each bed in a hospital, let us say, of three hundred and fifty beds, would be three hundred dollars, and that the laundering of this extra supply would take the time of two people for nine hours a week, costing in a year about ninety-five dollars, would they not listen more patiently when the person in charge asked that they limit themselves to a stated number of these articles?

I am strongly of the opinion that if every probationer were allowed to work several hours a week in the laundry, with the definite purpose in view of teaching her and not to save the expense of an extra person to the hospital, she would be a more careful nurse in the wards. She should sort the soiled clothes, or supervise their sorting, in order to see the large number of slightly tumbled but clean articles that come to the laundry, and also to see the ragged, torn clothes that nurses send down, and the large number of safety pins, which may mean destruction to other peoples' clothes and quite frequently injury to the hands of the laundry employees. She should sort the clean linen to see how important is clear marking and should note the time consumed in washing, mangling, and folding linen. In addition to this she should be taught the cost of each article.

Buying.—The superintendent will find it interesting and well worth while to note the differences in price of the same article in different localities, in different quantities, and at retail and wholesale prices. Some people advocate buying direct from the factory; others deem it wiser to buy through a merchant. Many factories will not deal with the consumer, though this varies with the part of the country in which one is located. One great advantage in buying from a retail merchant is that you can buy practically all your supply from one firm, thus saving many letters and many express charges; and by getting large quantities, you will probably get a better price. Merchants as a rule will give good price to hospitals, some having a special salesman whose whole time is employed in taking hospital orders. In small places, where the support of the hospital is in part dependent

on the good will and gifts of the people of the town, it would probably be good policy to buy supplies through the home merchants, and thus enlist their interest for the hospital.

The prices quoted in the lists given below are of course approximate, and would vary much in different localities, with the quantities, and always with the market. It is an open question as to whether it is cheaper to buy ready-made, or to have articles made in the hospital.

Repair.—Some small hospitals depend on convalescent patients to do the mending of linen. This is not always satisfactory. Very often the work is carelessly done, and many times one cannot wait for sewing to be done in that way. A small hospital may find that to have a seamstress come for a few days at a time is all it needs, or can afford. Some large hospitals have one woman who spends all her time mending; others have the whole force of seamstresses mend linen for two or three days, after exchange days, and spend the rest of their time making various articles.

The system of exchange of worn linen as now in vogue in most of the hospitals investigated seems a waste of everybody's time. If the sewing room where repairing is done is connected with the laundry, there seems to be no reason why torn linen should go to the wards. It would be perfectly practicable, and it is done in some hospitals, to have torn articles as they come from the mangles thrown into a basket, thus saving one folding. These articles can be inspected and either mended or discarded by the person in charge of the linen, who, being responsible for it, is much more careful about what is discarded than the nurses would be. There is undoubtedly much waste caused by the tearing up in the wards of linen slightly torn, which could have been repaired and if not fit for use in the wards have been used in some other part of the institution. This method of repair would save the time and strength that is consumed daily in the wards in getting out a piece of linen, unfolding it, possibly far from the linen shelf, finding it torn, and having to replace it with another, which many times is just as bad.

Store-rooms.—There must be in every hospital a certain reserve supply of linen. In the room where this supply is kept, there should be a record of all linen that has been purchased—the date, quantity, quality, samples if necessary, cost, and the name of the place where the purchase was made. There should also be a record of all articles given out, whether new or in exchange, and to what part of the hospital. It would be helpful if a record could be kept of the exact

measurements of all articles made in the hospitals, as this would insure uniformity of size throughout the institution.

Distribution.—There are two methods of distribution of linen in use in hospitals to-day, the ward linen-room and the central distributing linen-room. In the majority of the hospitals investigated the ward linen-room method is still in use. There the linen for each ward comes from the laundry and is there re-folded and put away. In some hospitals there is placed in each ward linen-room a correct list of the articles of linen that have been allowed to that ward—its standard, in fact. This list tallies with a list which is in the inventory book in the office of the superintendent of nurses. Systematic reference to this list will very quickly show when articles are missing, and it is found that the linen standard is more easily kept up with than if the list were not there.

Much time and strength could be saved in the wards if a little attention were given to training the people in the laundry to fold the linen properly. Would not a systematic placing of the articles on the shelves, having articles of one size in one place, and that place plainly labelled, also save time?

The ward linen-room method of distribution undoubtedly encourages extravagance in the use of linen in our wards. When there is a supply of linen at hand of which no account must be given, there is a great temptation to use it freely.

The central distributing linen-room is beginning to attract the attention of our superintendents. By this I mean one linen-room in which all the linen sent from the laundry is kept, and from there is distributed daily to the different departments, except, perhaps, to the operating department.

There are two ways in which this plan might be followed. When the method is first being inaugurated, each ward could be given a full supply for two days, it then being required that a soiled piece should be returned for each clean piece given out daily.

Another way would be to have the head nurse each day make a requisition for the amount of linen she will need for twenty-four hours. Men and trucks would be needed to do this distributing in a large hospital, but the same men who now deliver from the laundry to the wards might deliver from the linen-room instead. In this way may be prevented, what will oftentimes occur, an accumulation of linen in wards where the service is fluctuating, and utter emptiness in those that have a constant, heavy service. It means a more equal

distribution, and for that reason, a smaller supply. By this system a decided saving of time and ink in marking could be effected. If linen is distributed from one place each day to the wards, it would be only necessary to mark the linen with the name of the hospital and the date.

The supply of linen must be somewhat influenced by the length of time the linen remains in the laundry. Obviously, if the linen is returned every day, the supply may be smaller than when it is returned only twice or three times a week. The wear and tear on linen that is being so constantly laundered, however, must be considered. Some people feel that a larger supply will not insure the less frequent laundering of articles, for in a busy hospital there is little time to arrange for putting to-day's linen at the bottom of the pile. If there is a large supply, it will probably all be used.

A record of the number of articles lost in the laundry would be interesting. This is kept in some hospitals, the number sent out and the number returned being recorded. At the end of the year it is quite startling to see how much linen disappears, apparently in this way. I say apparently, because it must be remembered that many different people count the linen, and absolute accuracy cannot be guaranteed.

The following lists give estimates of the amount and cost of linen and other equipment required for a ward bed, and of the requirements in the nurses' and convalescents' homes:

Cost and Maintenance of One Ward Bed.

Institution spring bedstead.....	\$ 7.00
1 30 lb. hair mattress.....	12.00
1 3 lb. feather pillow.....	1.80
1 2½ lb. hair pillow.....	1.00
1 mattress protector.....	1.02
2 spreads, dimity, @ \$1.35.....	2.70
3 blankets @ \$3.50 per pair.....	5.25
6 sheets, 108" x 72" @ 85 cents each.....	5.10
6 sheets (draw) 54" x 90" @ 60 cents each.....	3.60
6 pillow cases 45" x 35" @ 18 cents each.....	1.08
4 towels @ 17 cents each.....	.68
2 towels, bath, @ 25 cents each.....	.50
4 gowns @ 58 cents each.....	2.32
Total.....	\$44.05

Nurse's Home, Linen List.

ARTICLES.	NUMBER REQUIRED.		SIZE.	COST.
	Nurses.	Help.		
<i>Articles per person</i>				
Blankets.....	2 double	2 double	72" x 84"	\$3.50-\$5.00 per pair
Bureau covers.....	2	—	—	
Mattress covers.....	1	1	72" x 36"	1.02½-1.22
Pillow cases.....	4	4	45" x 36"	.18 up
Sheets.....	4	4	99" x 72"	.80 up
Spreads.....	2	1X	84"x"	.75 up
Towels, face.....	6	4	—	.17 up
Towels, bath.....	2	—	—	.25 up
<i>Articles per 100 persons</i>				
Covers, serving table ..	25			
Cloths, dust.....	4 per maid			
Cloths, floor.....	4 per maid			
Table cloths.....	60	10		
Table napkins.....	400			
Towels, dish.....	14 per maid			
Towels, glass.....	14 per maid			
Towels, kitchen	14 per maid			
Towels, lavatory.....	14 per lav.			
Towels, roller.....	24			

Linen List, Convalescents' Home.

ARTICLES.	NUMBER REQUIRED FOR 30 BEDS.	ARTICLES.	NUMBER REQUIRED FOR 30 BEDS.
Blankets (single).....	90	Towels, bath.....	90
Doilies.....	150	Towels, face.....	150
Mattress covers.....	30	Towels, glass.....	10
Pillow cases.....	120	Towels, roller.....	25
Sheets.....	180	Towels, tea.....	40
Spreads.....	60	Wash cloths.....	90
Table napkins.....	150		

DISCUSSION ON LAUNDRIES.

Location.—Basement laundries are usually objectionable, especially in cities, because of lack of air and light. They are less so in the country if the windows are high and well above ground. If there are living and sleeping rooms above there may be unpleasant odors, vibration from machinery, and inflammable conditions. Massachusetts requires a certain number of cubic feet of air per person for health conditions. One basement laundry has been instanced where artificial ventilation gave air that was washed and cooled. No windows were open, yet the air was pure and cool all the time.

There are also objections to laundries and kitchens on top floors. While this does away with back door conditions, stealing, and loss of time, and the supervision is usually better, it is expensive in operation. Machinery can be placed on piers or pads as in laboratories but this also is expensive.

One hotel in Rochester has moved its laundry from basement to roof, however, and would on no account go back to the basement.

In considering locations, we must separate country and city conditions. A site for a building 30 x 40 ft. in Wall Street would cost \$600,000 and mean \$4000 a day in interest. Cities must use basements and applied science must make them livable. The responsibility is to the ultimate consumer.

Wellesley College Laundry.—When Wellesley College had to face the necessity for a new laundry, with no funds, a number of the faculty and trustees formed a stock company and built a model laundry costing about \$30,000. As a business proposition the Waban Laundry Association pays. On account of steam, noise, vibration, etc., it was thought more desirable to have it a one story building and it is practically a basement though the windows are high and run to the ceiling. It has a sunny exposure, a south-east and south-west receiving room, so arranged that clean clothes do not come in contact with soiled clothes, and there is no passing of employees through rooms where they have no business. It does the work for over 1000 students, besides faculty and help, and is equipped with improved machinery throughout.

The college president is a stockholder, as are also the vice president and the Sunshine laundry heads. Miss Davis, the director of the residence halls, is president, and takes an active interest; she keeps in touch with all the work, sometimes taking her place at the mangle

in working out experiments and time costs. Prices are lower than in usual city laundries, yet it pays.

There are sixteen halls of residence. Table clothes are changed three times a week and the students have three napkins a week. The laundry manager is paid a professor's salary, and the whole enterprise is on a dignified basis.

The laundry business is fascinating, with its piles of evenly folded, beautifully polished clean linen. It is a field for well trained, educated women. Two Girton girls manage the best laundry in Dublin, and it is no new thing in England to give instruction in laundry work.

The modern commercial laundry injures linen seriously. There is no real need of this with right conditions such as prevail in the Sunshine Laundry but prices are very high there and above the reach of most families. The greatest problem is so to reduce the cost that public laundries may be of use to the average family having no domestic service in the home.

The New England Kitchen averages 2000 pieces of flat wash a day and pays \$400 a month for laundry work. Taking the first cost of the linen plus the cost of keeping it clean, the wear and tear, investment, interest, etc., it is still cheaper to send to a commercial laundry and let it wear out than to do it by hand. On the other hand, it would cost Wellesley College \$10,000 a year to put out its flat work.

Commercial laundries usually charge by the hundred for flat work, lumping large and small pieces together. Others ask from 3 to 4 cents apiece for long table cloths, $1\frac{1}{2}$ cents for towels, and 30 cents per 100 for 21-inch napkins. The average rate per 100 is \$1.50.

A Chicago restaurant manager says that even if he has to replace his linen twice as often he will still be better off than to run his own laundry.

To the question, Why not make a laundry like that at Wellesley a laboratory for training others, as in nurse's training schools? Miss Davis answered that they could take a few students as workers, side by side with other workers, but that with careful work and fifty employees to consider, they could not for a moment think of taking any number or a whole class, as they would be asking all kinds of questions all the time.

There is much literature on laundry subjects in some German periodicals, especially studies of soaps and the wear and tear of linen. There is a laundry journal published in Cincinnati, *The Starchroom*.

Note on Paper on Organization of Service in Institutional Households.

The paper presented by Miss Alice Patterson, of Mt. Holyoke College, we are unable to publish at this time owing to the fact that it is still incomplete. It embodies some results of several weeks of study made by a student in the Department of Household Administration, Teachers College, New York City.

The study was undertaken with the view of determining the amount of time required by an expert worker to perform certain tasks in the daily work of the household, with particular reference, of course, to institutions. That division of the household which comprises bedrooms, bathrooms, halls and stairways was selected, the student spending some hours daily for a period of several weeks in observing and recording accurately the exact time spent by employees in the performance of different parts of their work. An endeavor was made to ascertain, for instance (a) the actual time taken to make a bed; (b) the actual time required to properly clean a room; and (c) how many rooms can be cared for in a given number of hours.

Further aspects of the study included (a) a consideration of the character and amount of furniture in the room and its position in relation to floor space; (b) the habits of the occupant of the room; and (c) the quality and character of the work done by the employee and the general standards of such work in the institution. Five college and school dormitories, widely varying in type, were selected, and through the courtesy of the heads of these dormitories, an opportunity for careful study of the problem was accorded to the investigator.

A field of extremely interesting and profitable study was discovered. Ideas as to the amount of work which could be accomplished within a given time varied greatly in the different institutions. The number of rooms assigned to each employee ranged from fifteen to thirty, or even more. The time allotment for certain grades of work and standards of work varied so greatly as to make quite clear, even from this brief and incomplete study, the necessity for prolonged and scientific study of the situation.

Of course many factors will have to be considered—the training of the employee, her skill and intelligence; the character of furnishings and decoration, whether simple or elaborate, and the consequent amount of labor required; the way in which the work is organized and directed and the amount of supervision and inspection given—all of these factors have a direct bearing upon the situation and will need to be carefully studied.

This partial study was also made of but one division of the household work, and could and should be extended to all other departments, such as kitchens, dining-rooms, laundries, and so on. Until some such careful, systematic study extending over a considerable period is made, the question of standardizing household labor as it is standardized in the manufacturing and industrial world cannot progress rapidly. We regret that this study of one of the divisions of the household is not yet sufficiently complete for publication, but trust to be able to present it in a later number.

ARCHITECTURE IN RELATION TO ADMINISTRATION.

Architecture in its Relation to Institution Administration.

HENRY WILHELM WILKINSON.

Architect, New York City.

I grew up in a great house in the country which was built by my father and was the apple of his eye. It seemed to all of us children a perfect house. The rooms were large and well proportioned and it was beautifully finished. It was cool in summer and warm in an arctic climate in winter—a perfect house. I remember with what a shock of surprise the first warning came to me that I must not admire it *unreservedly*. I recall when my mother first said, "Well, I never liked this house." It seemed to me sacrilegious, and it was only as I became older that I realized why my mother never liked it, that it had grave faults. All the stairs, though wide and easy, were dark; the kitchen was too large, the refrigerator window had been blocked by the billiard room addition, and had been made a side door to the billiard room, so that the refrigerator was always in the dark. I remember, too, that what was death to the refrigerator was life to the billiard room. From the point of view of every one but the house-keeper it was perfect, but she found that it was difficult to keep house in.

The old house burned in the summer of 1890 and a new house, in which the errors of the old were corrected, was built when I was a boy architect. The pendulum swung the other way: The stairs were ablaze with natural and artificial light; the refrigerator had a window all to itself. In the old house there were twelve bed rooms and only two bath rooms, for plumbing pipes were considered dangerous. The question when we built the new house was, "How *many* bath rooms should there be?" not "how *few*?"

The problems which are to be studied in buildings for institutions are the same that we have in our houses. In the kinds of buildings of which I myself have made a special study, and of which there are five classes—club houses, apartments, hospitals, schools, and dormi-

tories—we find domestic questions which must be worked out on a larger or more complicated scale. The house is the unit always. I might say that the house plan is the seed from which all kinds of different plans spring. In the club house we have to solve the house problem in a more public manner. In the apartment we have a congeries of houses fitted in together with a community of interests, and coöperation is the word for successful planning. In the hospital we have a specialized house. There is such a close connection between the private house and the hospital that I once designed a country house with an isolation room for contagious diseases and an operating room if by chance one of the children should have appendicitis. The usual ratio between the dining room and the kitchen is different. There are fewer living rooms and many more guest rooms in the hospital. In fact the whole idea of the hospital is still the idea of the house in which the problem is how best to entertain *most interesting* guests. In the college or school dormitory we have again a specialized house. In the man's college dormitory, for instance, there are usually nothing but guest rooms.

How are you going to study an architectural problem when your advice is asked? Most plans of buildings that you may have to deal with may be considered from the *house* point of view and from the domestic point of view. Working from this as a start, instead of being worried (as one may very well be when his advice is asked, and, as I confess, I very often am, even after twenty years' experience in planning), you will go back to the house as a starting point and just build up from the knowledge that each of us has about a house, what you will need.

I will put a concrete case—of a concrete building perhaps. Suppose, for instance, a certain Miss A is at the head of May Hall, one of the normal school dormitories at Framingham. Suppose a new dormitory is about to be built and the trustees ask Miss A for her ideas as to what this new building should be. The architect should have certain facts from Miss A in order to get the best results. First, how large is the building to be? How many girls must it hold? Are there to be forty, sixty, or eighty? Will there be two girls in a room, or will each girl have a room alone? How are the toilet arrangements to correspond with the bed rooms? How many baths will be allotted to how many bed rooms? In connection with the sleeping rooms and the bath rooms there will be, of course, linen rooms, rooms for extra bedding, the trunk room and housemaids'

closets. These develop other questions: How are the trunks to be carried in and out? Are the servants to sleep in the building?

On what floor will Miss A, who is to live in the building, have her own suite of rooms? What will be the size of the drawing room? Will it be used for dances and theatricals? Shall there be a stage? How many people will come to a reception there? What do the girls do in the evening? How about arrangements for music in the building? What are Miss A's ideas about open fires, piazzas? How large will the dining room be? Will the forty girls sit at four large tables, or eight small tables? Will there be a teacher at each table? Will there be rooms for teachers in the building? Will the girls wait on themselves? If not, how many servants are needed, and how will all the many conveniences of the serving room be arranged most economically?

As for the kitchen, I should like to talk with Miss A for hours. Whenever I have a large kitchen to design, I am always appalled by my lack of intimate knowledge of what goes on in the kitchen. I know about linen closets and broom closets and butler's pantries a great deal better than most housekeepers. I have had experience gained from one hundred or two hundred different sources, and know what two hundred different women have wanted in their butler's pantries, but in the beginning the problem of a great kitchen seems to me an almost insoluble riddle. I want Miss A's ideas about vegetable and soup kettles, how often she has to have her soup kettle *retinned* and how much it would cost. How large a range and what kind will suit her best, and will she want a gas attachment and a charcoal broiler? How about the dish-washing sinks? Is the usual wooden hotel sink the one she likes? Will she need a dish washer, if she can have it? Of course I know that Miss A will have to buy her stores in bulk to keep house economically, and therefore her store rooms must be ample, but how large? And what about the refrigerators?

I have now gone over the main items which will come under Miss A's management, but of course I will talk over with her the question of heating, too. If there is no central heating plant as at Framingham, how much coal will it take to run the building? Would Miss A like a two-, three- or four-story house best?

If the trustees are wise, they will certainly put the architect in close touch with the superintendent, but Miss A may have been allowed to make no suggestions as to the exterior. There she may have been

turned down hard, knowing that her practical training does not include architecture. It is the supposition, of course, that the exterior of the building will be designed in one of the recognized architectural styles.

I have found to my real sorrow that people do not care to know about architecture. They do not take it seriously. In the first place the locality, the neighbors of the new house, the site, the amount of money to be spent must be taken into consideration, and all these together with the best possible style to *express* the building. That building exteriorly is the *best* building, which *best* expresses the purpose for which it is used.

A Study of Floor Materials.

JESSIE C. SAUNDERS.

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The natural materials commonly used for floors are marble, slate and wood.

Marble is expensive, \$1.10¹ or more a square foot, but wears well and is easily cared for. Slate is less expensive, 75 cents a square foot, and is frequently used for stairs. The soft woods used for floors are cheaper than hard woods but do not make durable or beautiful floors. The slash of soft woods, that is, boards made from the middle part of full width boards, where the annual layers are parallel to the surface of the board, should never be used for floors, shelves or table tops, as it is apt to splinter. Rift boards are cut from the two outer portions of a full width board and will wear much better than slash as the annual layers are not parallel to the surface of the board. Plain wood floors and many parquetry floors are made of tongued and grooved $\frac{3}{4}$ -inch stuff.

Wood carpeting, another form of parquetry flooring, is made of $\frac{3}{4}$ -inch stuff glued to a stout canvas, and thoroughly nailed to the under flooring. Such a floor is said to wear very satisfactorily and gives as much depth of wood for actual wear as does ordinary flooring above the tongue. Parquetry veneer is $\frac{1}{4}$ -inch stuff and cannot be recommended. There are several patented systems of wood flooring

¹ New York City prices are given throughout.

using blocks or small pieces of wood and depending on some patented device to secure the upper floor to the under floor.

An ordinary under floor of common North Carolina pine will cost about 8 cents a square foot. Laid on this the upper floor of North Carolina comb grained pine will cost 11 cents a square foot; of Georgia comb grained pine 13 cents; of maple 14 cents; of birch 15 cents; and of oak 17 cents. The wood carpeting costs 27 cents a square foot and parquetry flooring of $\frac{7}{8}$ -inch stuff 42 cents. Of the patented floors a Rochester firm lays an oak floor for 38 cents a square foot and two New York City concerns for 50 and 60 cents respectively. These woodblock floors wear well, present a good appearance and have been laid in many government buildings, in some of Boston's public schools, in armories and, occasionally in hospitals. They are not satisfactory for dancing floors because of the continuous changing of the grain of the wood.

If a wood floor is used without treating the surface in some way, it soon becomes very unsightly and more or less unsanitary. The dust is fairly ground into the pores of the wood. Washing is small help for this only removes the dirt from the surface, while the water soaks into the fiber, causing the wood to swell and shrink alternately, to splinter, to decay gradually and to become dark and unevenly discolored. Moreover moisture is one of the conditions favoring the growth of bacteria, and the combination of soapy water and dirt which inevitably settles in the cracks between boards and around the bottom of the baseboard furnishes a medium for the growth of bacteria and insect eggs. Also, the floor is not only subject to hard wear, but it is fundamentally prominent as an element in the character of the room. If it is not treated as such, it strikes a discordant note that cannot be ignored or forgotten. The term commonly used expresses the fact:—the floor needs to be "finished."

To keep the floor from undue wear and to have sanitary and at the same time beautiful wood floors demands that they be covered with some protecting material. This may be done by using oil, shellac, varnish, a spirit varnish, or wax.

In her book, *Home Economics*, Miss Maria Parloa recommends using pure boiled linseed oil thinned with from one-quarter to one-half as much turpentine or alcohol. This must be rubbed in well; on new floors it should be used hot that it may sink in better, and after an hour polished with a woolen cloth. If the polishing is not done dust will adhere to the floor. Miss Parloa states that "such floors are not

easily soiled and they retain their luster and softness for years." She also states that this dressing can be used to advantage on a painted floor, on linoleum and oilcloth, but that the polishing must be given else dust will adhere, and on painted or varnished floor a cloudy appearance will be seen in a day or two. How often the treatment must usually be renewed is not stated. Oiled floors as commonly seen are not polished.

Shellac is often adulterated with resin, a more brittle gum, so that shellaced floors scratch badly. For ordinary household use it needs renewing every six months.

Varnish is also subject to adulteration but when good it makes a thin hard coating over the floor, bringing out and preserving the grain of the wood, protecting the surface from wear and rendering it more nearly sanitary. Two or three coats are necessary each requiring twenty-four hours to dry. In ordinary use it needs to be renewed yearly.

A spirit or alcohol varnish, called Farrington Floor Finish, has lately been put on the market. It is only adapted to hard woods but it dries in an hour and gives a much more moderate gloss than does varnish.

Waxes are of little use on soft woods. Two coats of wax may be used as a complete finish for a new hardwood floor. In ordinary household use such a floor should need nothing for a year except monthly polishing with the weighted brush and occasional retouching with wax in any worn spots. The next year's waxing can be done without removing the old wax. Or one coat of wax may be rubbed on top of shellac, varnish or spirit varnish, thus keeping this first protection from wearing off, neutralizing its too high gloss and making it possible to patch the spots that wear off. A sort of liquid wax called Waxene, a Boston product, can be used on a bare floor or as a finish over shellac or varnish, though it does not seem "to patch" so well as does hard wax.

Which is the most desirable method of finishing wood floors? Oil may not collect dust if polished, but it will undoubtedly darken the wood in the course of a few years. It is the cheapest treatment as to first cost. As frequency of renewal is not stated by Miss Parloa the up-keep cost is undetermined, but would be mainly for labor. Spirit varnish does not scratch as easily as do shellac and ordinary varnish, but all three wear off in spots, cannot be patched, and should be entirely cleaned off before a new coat is put on a floor. They do,

however, protect a floor momentarily from a chemical or anything hot or greasy spilled on it, and render a wood floor as sanitary as it can be so long as they are in perfect condition. The difficulty with shellac and varnish is that they begin to wear off immediately the floor is used and worn spots cannot be patched by applying more shellac or varnish. Shellac costs \$1.50 to \$2.00 per gallon and floor varnish from \$2.25 to \$3.50. The number of square feet that can be covered with a gallon will differ in accordance with the condition and kind of wood and the liberality in applying. Wax does not scratch and though it will wear off in spots, it can be patched perfectly. It protects the surface of the wood from general wear, but not from anything spilled upon it; it brings out the grain of the wood and makes a wood floor as nearly sanitary as possible. It costs rather less per hundred square feet than does varnish. To protect a wood floor as thoroughly as possible—also any stain, if such should be desired on a floor,—first put on a shellac, varnish, or the new spirit varnish,—preferably two coats. Then to prevent the shellac or varnish from wearing off in spots, as it surely would,—rub on a coat of hard wax, and polish it with a weighted brush. The wax must be renewed in spots as often as necessary to keep the under finish from wearing off. So treated, the shellac or varnish may be kept intact and no troublesome yearly renewal necessitated. Careful oversight of worn spots will be needed, but sanitary and attractive wood floors cannot be secured by neglecting them nor by washing them.

The artificial materials used for floors are in small units constantly repeated or in large surfaces. The common penny tiles cost 32 cents and the 2-inch hexagonal from 38 to 42 cents a square foot. Glass tiles are more expensive, \$1.00 and \$1.25 a square foot, and are not much used. Rubber tiles are about 10 per cent rubber and can be laid on either cement, concrete or wood providing it is level. They cost from \$1.00 to \$1.15 per square foot, or possibly a little less for a large contract. They have been on the market about fifteen years and promise to wear a long time. In elevators they wear out, but are subjected there to very hard use. Where one hall joins another the rubber tiling sometimes buckles up a little. This is rather expensive to repair and the new tiles show. The cost of upkeep in daily cleaning is considerable, as slight soil shows plainly. Halls where there is rubber tiling in Roosevelt Hospital, New York City, are washed twice daily and three times on visiting days. Rubber tiles are excellent for an incline and are very easy to walk on. They have been used

in many public and semi-public buildings, railroad terminals and ferry-boats. The City Hospital of Akron, Ohio, has rubber tiling throughout.

The artificial materials furnished in large surfaces include linoleum, rubber carpeting, monolithic compositions and a new material named agosote. The Germans manufacture heavy grades of linoleum, two or three times as heavy as is commonly used in America. They are using it somewhat in hospitals and on war vessels. A new hospital in Frankfort has wide strips of linoleum cemented through the centers of the corridors which have colored tiles at either side. Considerable colored tile and colored glass has been used in this building with excellent effect. A new hospital in Fall River is using linoleum throughout. Rubber carpeting has been in use for twenty years and can be made in sections as large as twelve feet square, or in strips three feet wide and of any length. It may be cemented to a level floor and wears twenty years or more, and costs from \$1.05 to \$1.20 per square foot. A worn spot can be cut out and repaired, and it is easily washed. It is used in many of the Pullman cars, in offices, and public buildings.

There are several styles of monolithic flooring. All alike are laid in a plastic condition on the underflooring, either wood or concrete, thus making possible coved sanitary bases and corners. They are not so heavy, so inelastic, or so cold as are clay tiles and are less expensive, costing from 23 to 50 cents a square foot according to the manufacturer selected and the size of the contract. If alterations involve breaking it, it can be mended and promises to be very enduring. It will inevitably show cracks if the building settles unevenly. Some makes have been on the market fifteen or twenty years. It has been used in hospitals, schools, public buildings and private houses. The French Hospital in New York City has one of these materials, called asbestolith, throughout its halls and wards and is well satisfied after six years' use. This particular monolithic material should not be washed with soap as the alkali of the soap unites with some ingredients of the asbestolith and causes it to disintegrate somewhat. In the French Hospital the halls and wards are mopped daily; every two weeks they are scrubbed by hand, and six times a year they are rubbed with crude oil. The head nurse says, "they are easier than tile to care for and as good as wood for the nurses' feet."

Agosote is a new material introduced from England where it has been manufactured for twenty-five years. It is made of paper and

rag, treated with chemicals, pressed into slabs, treated with an emulsion, and again subjected to great pressure. It has been used as a substitute for wood panelling in railway coaches all over Europe and even in South America, and is now being used for this purpose here. It can be painted, grained, varnished and polished to look exactly like any variety of wood. It can be kept for any length of time in boiling water without disintegrating, and will be thus made pliable so that it can be pressed into any desired shape, which it will retain when dried again. It is thus used for the curved roofs of railroad cars. It has some elasticity and may be developed into a successful flooring material by the American owners of the patent, The Pantasote Company of New York City.

Of nine hospitals visited, five have pine floors in the wards. In two of these, Bellevue and the Presbyterian, they looked clean and attractive. Bellevue is a new building, and the ward floors are cared for by men who clean with a vacuum cleaner in the morning and polish the floors in the afternoon every day. Every two weeks the spots are removed and new wax is rubbed on and polished. One man needs an entire afternoon to refinish a large twenty-four bed ward.

At the Presbyterian Hospital the wards are washed with oxalic acid and water every three months and then rewaxed with a preparation made in the hospital, and consisting of 5 gallons of turpentine, 20 ounces yellow wax, and 30 ounces paraffin. The waxes are melted and the turpentine warmed in a hot water bath and added gradually to the melted waxes. To each 5 pints is then added 2 drams of ammonia water. It is put on with long handled brushes and must be used hot. Five men care for all the floors and are each paid \$18.00 a month.

The wards at the third hospital (Mt. Sinai) are varnished once a year necessitating the temporary disuse of each for several days. Linoleum is laid all around each ward. When the floors are fresh they look fairly well, but soon become more or less dark in spots according to the degree of care given by each maid. The floors are simply wiped up with a damp cloth each day.

At the Roosevelt Hospital the wards were stained dark years ago and are restained and varnished every year. They are ugly and unsatisfactory. At the Hospital for Women, 19 West 101st Street, the floors have been kept bare and washed for fourteen years. The directors are now considering covering them entirely with one of the monolithic floor materials.

The wards at the New York Hospital have floors of German colored

tiles, laid thirty years ago. They have been kept in good repair at trifling cost. They are washed daily with a green soap solution made in the hospital, the maids using scrubbing brushes with long handles and also managing a rinsing cloth with a long handle. Patent wringers are not popular with these maids. A little hand scrubbing is required occasionally for door saddles, base boards and corners.

At the Sloane Maternity Hospital both German and domestic tiles are used and daily scrubbing is necessitated. Some of the tiles have a slightly polished surface and are much more easily cleaned. A marble floor in the main hall is even more easily kept in order.

Some wards at the Post-Graduate Hospital have tile and some a monolithic material, which is rather dark in color but is easily kept clean by mopping. The tiles need to be scrubbed with Sapolio to be kept in good order. The 2-inch hexagonal wear much better than the penny tiles, or small hexagonals. Here also they have a few wood floors, though not in wards, which had been left bare fifteen years and only washed. This year they decided to treat them differently, but it was found the wood was so filled with dirt and the boards so swelled that nothing at all satisfactory could be accomplished.

The ninth hospital (French) has monolithic floors in all halls and wards and is well satisfied. Of the nine hospitals not one considers wood floors desirable. Monolithic floors have been tried in only three of the nine, but are found satisfactory. Tiles are recommended by the other six.

Wood floors are least expensive in the first cost, but cost considerable for up-keep. As numerous cracks are eventually inevitable, even with the best of care, wood floors are not ideally sanitary.

Patented monolithic flooring comes next in expense, and for some makes is really very little more expensive than are the two floorings of wood. The cost of up-keep is less than wood and the floors are more durable. Clay tiles rank next both for initial expense and for up-keep cost, and rubber tiles are still more expensive.

In public and semi-public buildings wood floors should be avoided if possible. Considering the cost of up-keep some of the monolithic materials are cheaper than wood at the end of a few years. Wood should certainly not be used in halls and corridors.

DISCUSSION.

Monolithic floors on factory kitchens for lunch rooms in Buffalo have proved a great success, and are used for dancing when these rooms are given up to entertainments for employees.

The Good Roads Commission has experimented with cement mixtures, especially for roads, where they are subject to wear under definite conditions and so are thoroughly tested. Where an institution is considering laying cement floors it would be wise to consult Mr. Logan Waller Page of the Commission (address Office of Public Roads, United States Department of Agriculture, Washington, D.C.). His mixture is an original one unless the Romans solved the same problem 2000 years ago.

An asbestolith floor laid over a laundry was disintegrated by the heat. It is sometimes laid over wire netting on wood and is very beautiful when waxed.

In answer to the question, "What is the latest method of deadening a floor," filling for 2 inches between the joists with saw dust and mortar was recommended, doing this both above and below if possible. If there is not space, lay strips 1 inch above the plain floor and fill with mortar and saw dust. Asbestos lumber and shingles were also suggested as satisfactory but this is hard on tools. It was suggested that there should be a committee on such materials, to bring together the results of the best construction and experience.

Floor materials exhibit.—An exhibit of modern floor materials, sent from Teachers College, displayed samples from the following firms:

Marbleloid Company, Broadway and 34th Street, New York; Asbestolith Manufacturing Company, 1 Madison Avenue, New York; James G. Wilson Manufacturing Company, 3 West 29th Street, New York; I. H. Wiley Waxine Company, Boston; Warren Brothers Company, 59 Temple Place, Boston; Nightingale Company, 277 Broadway New York; American Encaustic Tiling Company, New York; Wood-Mosaic Floor and Lumber Company, Rochester, N. Y. and New Albany, Ind.; J. Percy Day, E. Victoria Street, Westminster, London S. W.; Pantasote Company, 11 Broadway, New York; Goodyear Tile and Rubber Company, New York; Mart and Lawton, New York; Farrington Company, Metropolitan Tower, New York; Buttle Parquet Floor Company, 607 West 43rd Street, New York; and Pennsylvania Rubber Company, 1741 Broadway, New York and Jeanette, Penn.

INSTITUTION ACCOUNTING AND RECORDS.

An Outline of Accounting for Institutions.

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We must recognize at the start that cost accounting attempts to give information that shall guide managers in the solution of three sorts of problems: first, how may prices be adjusted to the service rendered; second, does the utmost economy prevail in production and service, and if that is not found how may one trace the waste; and third, had certain work best be performed in their own establishments.

As an illustration of the first of these, need arises for some scientific method of fixing the prices of rooms in a college dormitory or in a hospital, so that the prices paid shall be adjusted to the comparative value of the rooms furnished. It may be true, of course, that in many cases prices are determined by what in railroading is called "charging what the traffic will bear." Thus, although it would normally seem that in some cases a higher price ought to be fixed, putting the charge on the same basis as the charges for other services such a basis would in reality make the charge prohibitive, and so adjustment must be made to that fact. In such a case the price must be lower than that which ought ordinarily to be charged, and that reduction in price is really of the nature of a rebate. If the accounting is serviceable, however, it will make note of both facts—that is, the fact that the actual cost of rendering the service is high in that case, and the fact that the price charged does not bear the same relation to cost that price bears in other cases. Unless the accounting takes note of both facts, it fails to tell the truth.

It is worth while at this point to note what is the purpose of accounting, for commonly a misapprehension prevails. It should be understood at the outset that accounting has nothing whatever to do with questions of policy. The purpose of accounting is to tell about business transactions the truth as exactly as it can be learned, and

the determination of the truth should be without respect to persons, prejudices or policies.

It may happen that for reasons of policy the price charged for service rendered is lower than the normal price. In a certain hospital the prices charged for certain private rooms are really lower than on any basis of cost they ought to be. The managers have made this arrangement with the distinct purpose of encouraging persons of means to come to the hospital for treatment; for they believe that the service rendered will be deemed so valuable, and the interest aroused in the hospital so great, that these persons will become valuable friends of the institution and that their influence will increase subscriptions and endowments. This may or may not be wise policy, but good accounting requires that some note shall be taken of the fact and that its cost for advertising purposes shall be considered.

As an illustration of the second sort of problem which cost accounting should help to solve is the economy of laundry work done on the spot. If it is found in any institution that the cost for laundry is 20 per cent higher than the average of other institutions, the management is not doing its duty unless effort is made at once to learn why this is so and whether it can be prevented. The conditions may be such that there is no escape. Then the question arises whether it would be cheaper to have the laundry work done outside.

As an illustration of the third sort of problem, we may take that which arises in many institutions concerning unused land. Most institutions have a considerable tract of land for air, light, and prospect, and much of this could be utilized for raising at least some summer vegetables. In many cases where this has been done the apparent cost of food has been much reduced. Yet it is impossible to know whether this is worth while unless one can know what is the expense for labor attributable directly to the vegetables raised. If the engineer or other employees have much leisure during the summer and that leisure can be devoted to this use, gardening of this sort is likely to be profitable. Only careful accounting can determine just when it is so under these or any other circumstances.

All three of these purposes of cost accounting demand that costs be known as exactly as possible; and the second of these demands that a manager shall know not only the cost in his own institution but in a great many others, for only then can he make comparisons between his own establishment and others and learn whether his costs are excessive. One encouraging feature in institutional service

as compared with commercial service is that the only rivalry that can be acknowledged—at least with a good face—is rivalry in efficiency. Every good institution is interested in institutional progress and is glad to conduct experiments and share results with others. Indeed, institutional progress would have been far slower if there had not been something of a professional spirit at work. Professional ethics demands that each person in charge of an institution shall have not only something of scientific eagerness to learn how things can best be done but also altruism enough to help others to benefit by his experience. In order to make possible comparisons of institutions under somewhat similar conditions a uniform scheme of accounting is essential. This means, moreover, something more than a uniform scheme of accounts; for even institutions with accounts of identical names may have results which are not at all comparable; uniformity must extend to the content of the accounts even more than to their forms and names. Before results can be made at all comparable we must be sure that in all institutions under consideration exactly the same kind of things are charged to each account.

Virtually, every institution manager who is subject to trustees or other superiors is eager for additional funds, for he believes that work can be done more economically or at least more satisfactorily with larger capital. The most efficient instrument for inducing trustees to supply needed funds is a statement of financial results which shows not only exactly the cost of each kind of service rendered but how those costs are related to similar costs in other institutions. Trustees are usually business men who know the value of a dollar. They wish to know definite facts about the yield of the dollars entrusted to them, and they are far more interested in these than in hypotheses and mere managerial ambitions. Every institution has some advantages over other institutions, and every one has some handicaps; but the good manager will attempt to learn by concrete figures exactly what are his handicaps and what they cost, and what are the actual savings from his advantages. He should not allow the handicaps for which circumstances—or the trustees—are responsible to swallow up the gains for which the credit is properly his. Until uniform accounting, or at least something approaching it, becomes common, no manager will be in a position to make clear to his trustees just what are the handicaps under which he is working and just what are the economics that have resulted from his management. As an illustration, I know a hospital turning away paying patients for lack of room, and yet

giving its matron private quarters which if let to private-room patients would yield several hundred dollars weekly; total costs in this hospital are high, far above its income; another hospital nearby, practically self-supporting, gives its matron quarters worth not half so much; yet the hospital giving its matron expensive quarters shows a lower administrative cost than the other. The objection is not necessarily to the spacious quarters supplied to the matron but to the fact that the accounts take no cognizance, in the administrative cost, of anything but salary, and therefore the result of this extravagance of space does not appear, and a comparison of the two sets of accounts is sadly misleading. Comparisons of accounts when the method of accounting is different are worse than useless, for they may show an advantage where there is really a handicap.

Let us now turn to the methods of learning costs. First, the accounts for each department having an exclusive function should be as far as possible distinct from those of every other department. The steward's department, for illustration, is concerned with food in a more or less raw state—except, perchance, so far as food is purchased necessarily in a cooked state, as are shredded wheat and numerous other cereals. It may chance that in some institution the purchasing is careless and therefore the costs high, and yet the cooking is extremely economical. In such a case, unless a distinction is made between the steward's department and the kitchen department, the normal gross cost for table board, if only that figure is preserved, may hide the fact that one department is well managed and the other ill. The kitchen should be charged for the cost of cooking food and for that alone; this should include the cost of fuel, labor, repairs, etc. The serving department should also be distinguished from the others, for in some cases there is very great wastefulness in the unfortunate arrangement of the establishment, so that the cost of service brings up the total cost of food in spite of the fact that both the purchasing department and the cooking department are well managed.

The expense of the purely housekeeping items, such as sweeping, dusting, and scrubbing, should not be confused with other expenses. Where some of this work is done by persons employed primarily in other departments, as is often the case in hospitals where the nurses have charge of patients' rooms, an attempt should be made to distinguish between that part of the nurses' wages which is for professional care of patients and that which is for housekeeping. At least it is true that the cost of taking care of the general rooms, such as halls, stairways,

reception rooms, assembly rooms, etc., should be carried distinct from the cost of the care of private rooms. Laundry charges should be carried distinct from all others, and should include fuel, soap, starch, labor, etc.

The cost of the care of grounds should be separately determined; this would ordinarily include the care of flower beds, the mowing of lawns, shoveling snow from walks, etc. This appears on the face of it to be a small item, but it is obvious that an institution having large grounds with many walks has a very much heavier charge in this respect than others, and a manager who is judged by his total cost per resident-day is handicapped as compared with a manager who has no expensive grounds to care for; he should be able to point out to the trustees of his institution just what it costs to maintain its external attractiveness. Separate accounts should be kept for maintenance of buildings and for maintenance of equipment. Of course, as in all business operations, separate accounts should be kept for taxes, insurance, water, gas, electric light, legal expenses, etc.

The accounts just mentioned may be called the primary accounts. These require nothing more than simple bookkeeping. We must now pass on to the accounting which involves an analysis of transactions so that the distribution of charges may be properly determined. In order that we may know what are the exact costs for various kinds of service it is necessary to know not only the total per capita cost per day but the per capita cost of each of many separate items per day. We must distribute most of what are commonly called "overhead" costs—that is, costs incurred for several services in common—among the various departments.

To say that we must know the costs of rooms for employees is not to recommend stinginess in provision for them; to say that we must figure the difference in cost between a seven by seven bed-room and a ten by twelve bed-room is not to recommend the seven by seven bed-room; it is only to say that we must know what we are getting for the money spent. All the costs which are indirectly incurred for any department should be ultimately carried to the accounts of that department. It will cost more to do the laundry work in an establishment paying its laundresses such high wages that they can live comfortably in rooms which they must hire in the neighborhood at normal city lodging-house prices than in an institution where the laundresses are boarded on the premises; and if the accounts in both of these cases charge to the laundry department only the actual

money-wages paid, one will show a high labor cost and the other a cost singularly low. Before any comparison can be made between the two cases, therefore, the laundry accounts must be brought to a common basis and the cost figures for laundry work must include not only the obvious primary costs like fuel, supplies and wages, but also a charge for laundry space, for laundresses' rooms, for food (including cooking and serving), for the laundresses' own laundry work (if done in the laundry), for lighting, for heating, etc.; and we must realize that included in the cost of the rooms are necessarily not only the care of the rooms but a share of insurance, taxes, depreciation, etc., on the cost of the building. In other words, every secondary cost involves many other secondary costs, and no comparison is possible between two institutions until a general scheme of distributing such secondary costs has been applied to them all.

This sounds very complicated. As a matter of fact, however, when a system has once been devised it is not a laborious task to make a proper distribution of secondary costs, and no extensive bookkeeping is involved. When the primary accounts have been charged with the obvious items of cost, we have merely to subdivide the total of those which stand at the foundation of the whole institution and distribute them among the various departments on an equitable basis. For illustration, insurance on buildings, taxes on buildings, depreciation of buildings and repairs of buildings, are shared by the various departments in the ratio of the building space occupied. Usually the square foot of floor space is a satisfactory unit for distribution—unless, indeed, it chances that some stories are higher than others or some buildings are less expensive than others. It is obvious that if the first story has a height of twelve feet, the second ten, and the third eight, it is hardly fair to distribute room costs on the basis of floor space alone, for the expense of the structure lies in height quite as much as in horizontal dimension. Ordinarily, too, an upper floor is less desirable than a lower. In the matter of cleaning, window space and wall space may be quite as important as floor space. The actual distribution must be determined in every case by the circumstances of that case, and when the principle has once been recognized there is likely to be very little serious discrepancy as between institutions. Ordinarily, it is enough to say that if the dining room occupies one thousand square feet and the whole establishment occupies fifty thousand square feet, the serving department should bear one-fiftieth of this group of expense—as well, of course, as an additional share

determined by the floor space occupied by waitresses' sleeping rooms. Lighting may well be distributed by the ratio of the number of lights in a room to the total number, although, of course, allowance must be made for rooms which are only occasionally lighted. Heating would ordinarily be distributed on the basis of cubic capacity—for the normal time a room is heated.

The most complicated figure to get is likely to be that for food costs, —at least in an institution supplying several kinds of diet. In a hospital, for instance, there is likely to be a table for house officers, which may or may not be the same as that served ordinarily to patients in private rooms; next in order is likely to come the regular house diet for patients in wards and for nurses; next comes the coarser diet for non-professional employees; and last, the fever or liquid diet. Many institutional managers will say that the attempt to learn just how much food goes to each of these groups of diet is more expensive than the value of the information will warrant. I believe they speak without adequate knowledge, for much of the needed information is—or should be—at hand.

In any accounting worthy of the name careful store records are kept. Everything going into the storeroom is debited, and everything going out is credited. Many things go out of the storeroom for use in all four of the classes of diet mentioned, and many others go out for the use of only one of them; but it is always someone's business to know the destination of everything issued. Three kinds of records of stores going into the kitchen will usually give all necessary information with a minimum of labor. The first of these should show for each meal the foods peculiar to one diet—such, for instance, as high-cost fruits or meats for private patients. The second sort of record should show for each meal the foods common to several diets but peculiar to that meal, such as vegetables and desserts. The third sort of record should show for long periods—*e.g.*, monthly—the consumption of common foods general for all diets. A small amount of additional labor will give the exact cost of food material for each diet.

Lists of the first sort, that is, for foods peculiar to certain diets, must, of course, be made out and figured for each meal; but as a matter of fact the housekeeper must regularly provide such a list as a guide in the preparation of the food, and the only additional labor necessary for learning costs is that of entering the amount consumed, the price, and the product. The calculation may of course be made in the office at convenient intervals.

Exactly the same thing is true of the second sort of lists. The total cost divided by the number of persons served gives the cost per person for each thing served. Food listed on the third sort of record, such as flour, sugar, butter, milk, etc., ordinarily needs to be registered only monthly, for these things are presumably consumed in something approximating a steady proportion for all kinds of diet. It may be known, for instance, that persons on fever diet consume only one-eighth as much flour and sugar as those on house diet. If that is the case, the number of fever-patient meals should be divided by eight before determining the ratio. If account of stock is taken monthly, the figure of cost for foods of this sort may be determined by dividing the cost of the total consumption for the month by the number of meals served, and charging each department on the basis of its own number of meals.

At the end of the month we have in these records the total cost for food for each class of diet, as follows; list 1, total cost of special foods; list 2, total cost of foods common to several diets but not common to all meals; list 3, total cost of foods common to all diets and all meals. The total of each list divided by the number of meals served on that list gives the average cost per meal for that list. For each class of diet, the sum of the averages of those lists which served that diet is the total average food cost per meal.

If to this food cost we add the kitchen cost—which is the sum of the space-cost of the kitchen, cooks' wages, fuel cost, rooms and board of cooks, etc.,—the serving cost, the housekeeping cost, the laundry cost, room cost, etc., we have the total cost per resident day. This is obviously our final figure, the ultimate thing sought,—for all the departments are subservient to the residents. As we go along, however, we determine for each department its own cost, in order that we may know whether it is most economically managed.

Under the method of primary and secondary accounts outlined above any number of subdivisions may be made, and even with uniform accounting an institution desiring to trace any detailed costs may make as many as it likes without destroying the uniformity, if only its subdivisions are based on the uniform plan—that is, are capable of combination to produce a total identical in significance with that of the institutions which have not made subdivisions. The minute subdivisions would ordinarily be kept for purposes of comparison one year with another within the institution, whereas the figures for groups as a whole would ordinarily be kept for comparison with those

for other institutions. It is not ordinarily possible to compare detailed figures with those for other institutions, for conditions are widely different. Total laundry costs per resident day, for instance, may well be compared between institutions, but the cost of fuel should be used for comparison mainly within the institution itself; for one laundry may use coal, another wood, another gas, another oil, another electricity, and another steam.

Accounting is something more, however, than determining mere financial facts. Statistics are of great importance in making it possible to learn why differences in costs persist. With regard to food, for instance, it is true that institutions in some places are able to buy meats much more cheaply than others, but suffer a considerable loss in comparison with others in the purchase of groceries. Differences are very great with regard to dairy products. If, then, we are going to compare food costs and get results worth anything, we must know something of the conditions under which each institution operates. We need to know not only what prices it is forced to pay, but also what is the prevailing tendency in that institution with regard to the kind of diet furnished. For this purpose it is well to keep statistical figures for the average price of several groups of food, such, for instance, as beef, mutton, lamb, fowl, butter, milk, eggs, etc. To these may well be added the average price per pound for certain staple articles like flour, sugar, tea, coffee. Lastly, in order that the records may show the relative importance of various classes of food in the total cost of diet, the total expenditure in each of these groups should be reported. These groups may well run as follows: meat, poultry, fish, groceries, fresh vegetables, canned vegetables, fresh fruits, dried fruits, canned fruits, butter, milk, cream, eggs. Such figures would show surprising differences between different institutions. If any establishment shows a conspicuously low purchasing power of money, that fact should stand out so clearly that the reason is sure to be investigated.

Innumerable other statistics not burdensome to compile are valuable as guides in determining comparative costs. For illustration, the number of pieces of laundry work, distinguishing the character—as by separate count for sheets, towels, pillow cases, etc.—is important if per capita costs are to be compared. The area of garden plots, of lawn to be mowed, and of walks to be kept free of snow, are convenient figures. The area of floors swept weekly per capita gives a hint as to the comparative cost of housekeeping labor. Many of

these figures, such as areas and ratios of area, are practically unchanging, and calculations once made are good for months or years. When ratios need to be applied to changing monthly totals, calculating devices like the slide-rule and adding machines may be utilized so as almost to eliminate clerical cost.

In closing, let me reiterate the need of uniformity. No man ever progressed far if he relied wholly on what he learned by his own experience. It is absurd to spend time and money learning for yourself what your neighbors learned years ago,—or even what they are now learning. If they are conducting experiments in some lines, you can most profitably conduct experiments in another. Then compare notes and teach one another what each has learned. Only through uniformity, however, can you ever compare notes and profit by one another's experiments.

Shop Methods Applied to Household Administration.

Miss Florence Cushing, who had visited the Bethlehem shops where Mr. F. W. Taylor has introduced the results of scientific time study as a foundation for the best management, gave a brief account of his success in coupling "high wages for workmen with low labor cost for employer." The first requisite is "knowing exactly what you want men to do, and seeing that they do it in the best and cheapest way." The key note is coöperation in place of opposition. First class tools, in first class order, are required.

Mr. Taylor has spent over \$60,000 in experiments of time study, with a stop watch. He began by watching the best pig iron worker at Bethlehem, who did just as directed and increased his output from 3 to 4 times. When thus standardized, picked men were put on piece work with the result that in two years, from 400 to 600 laborers handling raw materials, who had been paid \$1.15 a day, accomplished tasks from $3\frac{1}{2}$ to 4 times as great and were paid \$1.85, every man handling 57 instead of 16 tons each day. There were only two drinking men among these picked workers, and all saved money and lived better.

Time study and an improved system in the inspection of balls for bicycle bearings resulted in 35 girls, who had been in service from 8 to 10 years, doing the work which formerly required 120. They averaged from \$6.50 to \$9 a week instead of from \$3.50 to \$4.50.

A study of motions in laying bricks was made, just how high mortar should be placed above the scaffold; the size of hods was also figured. The result was that 17 motions were reduced to from 5 to 7 with unskilled labor. Work in the Bethlehem Steel Company has been revolutionized. In Berlin 1000 engineers are studying similar methods. These ideas have been applied in some cases without intelligence and have failed, injuring their reputation. Mr. Taylor himself uses the utmost care, will spread the system only through his own men, and is not yet ready to print results.

DISCUSSION.

There is one serious objection to this method. A man has to do everything by prescription and there is no chance to use his own brains, which is vital to the progress of the workman. The most serious problem in the mechanic arts is that it makes a man a machine. We must also shorten hours or spoil the man.

Professor F. G. Benedict has studied the amount of energy required in type writing, and hopes to measure in calories the energy expenditure for all kinds of house work.

We are putting into human life improvements for increasing efficiency. Look over the results of progress in the mechanic arts, the automobile, flying machines, wireless communication; why not increase the efficiency of human life from 5 to 10 fold in the future by such methods?

BRIEF RECORDS OF THE FIRST SECTIONAL CONFERENCE ON HOUSEHOLD AND INSTITUTION MANAGEMENT OF THE ADMINISTRATION SECTION OF THE AMERICAN HOME ECONOMICS ASSOCIATION.

Following an invitation from the Lake Placid Club, an important conference of members of the American Home Economics Association engaged in household and institution administration, or in related teaching fields, was held at the Lake Placid Club, Essex County, New York, from Tuesday, June 28 to Saturday, July 2, 1910.

The formal program for the conference as presented was as follows:

Tuesday, June 28.

- The expanding field of household administration.—Miss Adelaide Nutting, Teachers College, New York City.
- Certain phases of instruction in institutional management.—Miss Sarah Louise Arnold, Simmons College, Boston, Mass.
- Dormitory life for college women.—Miss Marian Talbot, University of Chicago.
- Qualification and training of the head of the college dormitory.—Miss Lydia Southard, House Director, Whittier Hall, Teachers College, New York City.
- Essentials in the training of dietitians.—Miss Florence R. Corbett, Whittier Hall, Teachers College.
- Practice-fields for students in institution management courses.—Miss Mary Urie Watson, Macdonald Institute, Guelph, Ontario.
- The pupil dietitian.—Miss Grace E. McCullough, Mass. General Hospital, Boston Mass.

Wednesday, June 29.

- The institution kitchen and dining room: Its arrangement, equipment and service.—Miss Martha Van Rensselaer and Miss Flora Rose, Home Economics Department, Cornell University, Ithaca, New York.
- Dining room management.—Miss Charlotte Way, Domestic supervisor, Rockford College, Ills., Mrs. Mary H. Moran, New England Kitchen, Boston.
- Menus and meal systems.—Mrs. Melvil Dewey, Lake Placid Club.
- Nutrition investigations in relation to dining room management.—Dr. C. F. Langworthy, U. S. Dept. of Agriculture, Washington, D. C.
- Lunches for High School Students.—Miss Emma Smedley, William Penn High School, Philadelphia, Pa., Miss Alice C. Boughton, Starr Centre Association, Philadelphia, Mrs. Alice M. Hotchkin, supervisor of high school lunch rooms, Rochester, New York.

A lunch room for working girls in which simple instruction is given.—Miss Katherine Lage, Manhattan Trade School, New York City.

School diet in relation to growth.—Miss Gwendolyn Stewart, Scranton, Pa.

Thursday, June 30.

Domestic and institutional laundries.

Equipment.—Miss Clara D. Noyes, St. Luke's Hospital, New Bedford, Mass.

The laundry as a commercial enterprise.—Miss Jane Seymour Klink, Brooklyn, N. Y.

Courses of instruction in laundry management.—Miss L. Ray Balderston, Teachers College.

Standards of linen supplies in institutions.

The hospital linen supply.—Miss Louise Powell, Superintendent of training school for nurses, Hospital of the University of Minnesota.

The organization of service in institutional households as regards time and other factors.—Miss Alice Patterson, Mt. Holyoke College, South Hadley, Mass.

The general organization and administration of college dormitory groups.

2.15 p.m. Business session.

Friday, July 1.

Architecture in its relation to institutional administration.—Henry W. Wilkinson, New York City.

A study of floor materials.—Miss Jessie C. Saunders, New York City.

Decoration and furnishing of college and school dormitories.—(Discussion.)

The financial management of institution households and dining rooms.

An outline of accounting for institutions.—Prof. William Morse Cole, Harvard University.

Melvil Dewey, President Lake Placid Club.

3 p.m. Discussion—Accounts, architecture, floorings.

Saturday, July 2.

Ideals in the administration of the college dormitory.—Mrs. Marion Lincoln Chamberlain, Dean of Women, Rhode Island College, Kingston, R. I.

Business meeting of the section on institution management.

An address of welcome to the Lake Placid Club was given by its president, Melvil Dewey. Mr. Dewey briefly reviewed the progress since eleven pioneers came together at Lake Placid eleven years before to discuss how best to apply the teachings of science to the problems of the modern home and how to introduce such teaching into schools of all grades, and then spoke as follows:

To-day we are laying the corner stone of a new profession, demanding trained women of the best ability. This meeting is a mosaic of teachers and administrators. Many educators teach before they

know just what to teach. The appropriation of a salary and appointment of a professor is not enough to establish a new course of study, for we must know the best way to do things and just what to teach. The world is now in unstable equilibrium; just as fast as something better is found it accepts new things. It wants to improve but there is too much inertia. Many things are now in the air. We must focalize and interchange ideas by that subtle mental chemic action and reaction which crystallizes thought. We must formulate, record, and constantly improve as in therapeutic medicine.

The best things are usually started by a few earnest people with faith. The influence of this meeting, which is five times larger than the first, eleven years ago, will be felt through college dormitories, schools, apartment hotels, coöperative homes and institutions of all kinds. In ten years we shall see greater progress than in the past decade. We have dreamed dreams and seen visions but this work is still in its infancy. The key note of this meeting is, we must first know *what* to teach as the best methods.

At a business session held June 30, the following were chosen as an executive committee: Mrs. Melvil Dewey, Lake Placid Club, Essex Co., N. Y., chairman; Miss Adelaide Nutting, Teachers College Columbia Univ., New York City; Prof. Wm. Morse Cole, Harvard University, Cambridge, Mass.; Miss Martha Van Rensselaer, Cornell University, Ithaca, N. Y.; and Melvil Dewey, Pres. Lake Placid Club, Essex Co., N. Y. Miss Lydia Southard, Teachers College, Columbia Univ., New York City, was later appointed secretary.

Committees were also appointed, as follows:

On Existing Demands in Institution Work, Miss Martha Van Rensselaer, chairman; Administration, Mrs. Melvil Dewey, chairman; Curriculum for Training for Institution Management, Miss Florence Corbett, Teachers College, chairman, and Miss Lydia Southard, Teachers College; and Resolutions, Dr. Benjamin R. Andrews, Teachers College, Miss Maude Gilchrist, Mich. Agricultural College, and Mrs. Olaf N. Guldin, chairman Home Economics Department, General Federation of Women's Clubs, Fort Wayne, Ind.

Among the resolutions reported by the Resolutions Committee and adopted at the closing meeting, July 2, were the following:

(1) It is significant that this first conference should meet at the same place and under the same auspices as the first conference on Home Economics a decade ago. We congratulate Mr. and Mrs. Dewey on their services to the cause, and we hereby express our appreciation of their great contribution to the work.

(2) (a) That the conference emphasize the ideals of rational living in home, institution and community life; (b) that we utilize all proper methods to advance these ideals in education in both elementary and higher schools; (c) that we urge the necessity of a professional training for those concerned in household and institution management; (d) that we work for increased government support of scientific investigation in this field, and a similar provision in universities and technical schools; (e) that we arrange for the preparation and dissemination of needed literature on institution management; (f) that we organize and assist meetings and conferences where these subjects are considered, so that the public may realize their importance as a basis of conservation of human life, as well as of material resources.

(3) That the conference records its conviction of the great importance of sectional conferences like this dealing with definite divisions of Home Economics as well as the general meetings whose programs include the whole field of Home Economics, and that we request the committee on institution management to arrange for a conference in 1911.

(4) That we express our appreciation of the great value of the JOURNAL OF HOME ECONOMICS, and urge our members to extend its circulation among institutions, libraries, clubs and individuals who will find it valuable as the authoritative publication in the field of home and industrial management.

That the executive committee of the American Home Economics Association be requested to consider the possibility of adding some supplementary phrase on the title page of the JOURNAL which shall express its relation to the institutional field—for example, "JOURNAL OF HOME ECONOMICS—Home, Institution, Community."

(5) That the conference approves the proposed federal legislation providing national support for education in Home Economics; specially that we urge favorable action by congress on the Davis-Dolliver Bill which will extend support to secondary and normal education in Home Economics.

(6) That the executive board of the section be authorized in the interval between its meetings to act on any matter which four-fifths of the board agree shall not be postponed till the next meeting, and where the action proposed correctly represents the majority sentiment of the section.

(7) Resolved that the members of this conference express their sense of loss in the death of Mrs. Adelaide Hoodless who so long and ably promoted the cause of Home Economics education in Canada.

In addition, the section voted to ask that a committee of five be appointed to formulate standards of certification to be required in Home Economics training, similar to the standards required for certified public accountants; that a committee on laundry and linen supplies be appointed, this being referred to the committee on administration; that the committee on resolutions be asked to formulate a protest against the vulgarity of so much elaborateness and display in relation to food; that it is desirable that the Graduate School of Home Economics be affiliated with the American Home Economics

Association; advocating the admission of suitable advertising to the JOURNAL OF HOME ECONOMICS; and asking that the JOURNAL issue a special number, containing the proceedings of the Conference.

The conference then adjourned.

LIST OF ATTENDANTS AT THE CONFERENCE.

- ALLEN, LYDIA G., 24 S. West St., Media, Pa.
ALLINE, ANNA L., 74 Cottage St., Buffalo, N. Y.
ANDREWS, BENJ. R., Teachers College, Columbia University, New York City.
ANDREWS, MRS. B. R., New York City.
BALDERSTON, L. RAY, Teachers College, Columbia University, New York City.
BARBER, CARRIE B., Northfield Seminary, East Northfield, Mass.
BARCLAY, MRS. SOPHIE C., Margaret Bennett Home, Baltimore, Md.
BARNUM, MRS. CHARLOTTE P. ACER, Pittsford, Monroe Co. N. Y.
BARNUM, NATHANIEL C., Pittsford, Monroe Co., N. Y.
BOUGHTON, ALICE C., 4424 Larchwood Ave., West Philadelphia, Pa.
BRADT, CECILIA K., Margaret Morrison Carnegie School for Women, Pittsburgh, Pa.
BRAY, EVELYN, London, Ontario.
CAMERON, MRS. KATHERINE MORSE, Mich. Agr. College, East Lansing, Mich.
COLE, PROF. WM. MORSE, Harvard University, Cambridge, Mass.
COOPER, LENNA F., Sanitarium, Battle Creek, Mich.
CORBETT, FLORENCE R., Teachers College, Columbia University, New York City.
CROSBY, MRS. W. H., 1042 Main St., Racine, Wis.
CUSHING, FLORENCE M., 8 Walnut St., Boston, Mass.
DAVIS, OLIVE, Wellesley College, Wellesley, Mass.
DEWEY, MRS. ALVIN H., 50 Harper St., Rochester, N. Y.
DEWEY, MRS. ANNIE, Lake Placid Club, Essex Co., N. Y.
DEWEY, MELVIL, Lake Placid Club, Essex Co., N. Y.
FISHER, KATHARINE A., Macdonald College, Ste. Anne de Bellevue, Quebec, Canada.
GIBBONS, EMMA C., Beebe Hall, Wellesley College, Wellesley, Mass.
GILCHRIST, MAUDE, Mich. Agr. College, East Lansing, Mich.
GULDIN, MRS. OLAF N., Fort Wayne, Ind.
HILL, SARAH C., The Bayard, New Brunswick, N. J.
HOOVER, JESSIE M., No. Dak. Agr. College, Fargo, No. Dak.
HOTCHKIN, MRS. ALICE M., 24 Calumet St., Rochester, N. Y.
LAGE, KATHERINE, Manhattan Trade School, 421 W. 121st St., New York City.
LANGWORTHY, C. F., U. S. Dept., Agriculture, Washington, D. C.
MACMILLAN, NEALINA, Macdonald College, Ste. Anne de Bellevue, Quebec, Canada.
MARTIN, ELLA, 5959 Midway Park, Austin, Ill.
MORAN, MRS. MARY H., New England Kitchen, 39 Charles St., Boston, Mass.
MORTIMER, MABEL, Macdonald College, Ste. Anne de Bellevue, Quebec, Canada.
NUTTING, M. ADELAIDE, Teachers College, Columbia University, New York City.

- PATTERSON, ALICE M., Mt. Holyoke College, So. Hadley, Mass.
PETT, MRS. CLARA G., Winona, Minn.
ROSE, FLORA, Cornell University, Ithaca, N. Y.
SANBORN, GERTRUDE, San Antonio, Texas.
SHARP, KATHARINE L., Lake Placid Club, Essex Co., N. Y.
SMEDLEY, EMMA, 6 East Front St., Media, Pa.
SMELLIE, M. I. L., Macdonald, Guelph, Ontario.
SOUTHARD, LYDIA, Whittier Hall, Teachers College, New York City.
STUBBS, ANNA M., Mechanics Institute, Rochester, N. Y.
TENNANT, ETHEL J., Macdonald Hall, Guelph, Ontario.
THATCHER, RICHARD H., Hamilton Court, 39th and Chestnut Sts. Phila.
TUTTON, MABEL A., 140 York St. Buffalo, N. Y.
VAN RENSSELAER, MARTHA, Cornell University, Ithaca, N. Y.
WATSON, MARY URIE, Macdonald Institute, Guelph, Ontario.
WAY, CHARLOTTE M., Rockford College, Rockford, Ill.
WELD, JENNIE H., Simmons College, Boston, Mass.
WILKINSON, HENRY W., 114 East 28th St. New York City.

ANNOUNCEMENT OF ANNUAL MEETING, DECEMBER, 1910, OF THE AMERICAN HOME ECONOMICS ASSOCIATION.

The third annual convention of the American Home Economics Association will be held at St. Louis, December 27-30, 1910, in connection with the conventions of the American Economic and the Sociological Associations.

Annual meeting of the council, Tuesday, December 27, at 10:30 a.m.

The following items of business, among others, will come up: Reports of the President, Secretary, and Treasurer; reports of affiliated local societies; report of the Editor of the *JOURNAL OF HOME ECONOMICS*; report on plans for the management of the *JOURNAL* during 1911. Other items of business to be proposed should be reported to the secretary at once.

The provisional program for the meeting at St. Louis, with the persons in charge of program arrangements, follows:

One meeting with speakers from American Economic Association. Program: Secretary Andrews.

One meeting with speakers from American Sociological Association. Program: Secretary Andrews.

Two Education Section meetings (Elementary and High School Problems). Program: Mrs. Alice P. Norton, University of Chicago.

Two Administration Section meetings. Program: Miss Adelaide Nutting, Teachers College, New York City.

Instruction and Research in Chemistry and Dietetics. Program: Miss Edna Day, University of Kansas, Lawrence, Kansas.

Instruction and Research in Economics (Household Economics). Program: Miss S. P. Breckinridge, University of Chicago.

Instruction and Research in Textiles and Applied Art (Dress, Decoration, etc.). Program: Miss Abby Marlatt, University of Wisconsin, Madison.

Instruction and Research in Housing and Sanitation. Program: Miss Isabel Bevier, University of Illinois. Urbana.

Methods of Extension Work for Rural Communities for Women's Clubs, etc. Program: Miss Rosa Bouton, University of Nebraska, Lincoln, Neb.

General Public Session—Education for the Home.

It is especially requested that members of the Council send immediately to the persons named above suggestions of titles of papers or of persons who might contribute papers. Particularly it is hoped that there may be included under each heading reports of studies, thesis problems, research work, etc. now under way in different institutions. Such reports may have to be read by title only at St. Louis, but they can be included in the printed proceedings.

The headquarters of the Association will be at the Planters Hotel, St. Louis, which gives special rates to delegates. The granting of special railroad rates depends upon the attendance of 1000 persons at the conventions meeting at St. Louis during the week.

It is hoped that teachers in the colleges and schools of the middle West and South, and those concerned with problems of management in institutions, will rally to the St. Louis meeting. A strong local committee is arranging the coöperation of interests in St. Louis and a good program is assured.

General information may be secured from the Secretary of the Association, Benjamin R. Andrews, 525 W. 120th St., New York City.

T H E Journal of Home Economics

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No. 6

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THE TEACHING OF HOME ECONOMICS AS A PROFESSION.

ELIZABETH C. CONDIT.

Jacob Tome Institute.

A profession is commonly regarded, whether from the purely personal point of view or in a general way, by its mercantile value, its congeniality, and the opportunity presented for service to society.

Much has been written of the teaching of Home Economics in our schools and colleges, and the need of it is so constantly and strongly demonstrated on every hand, that I shall consider its place in the school curriculum as established.

Does the teaching of Home Economics offer a fair return for the necessary time and money spent in preparation? The high school graduate must spend at least two years in a school of domestic science and if she is very young or immature or deficient in preparation three years. The average cost of tuition, living, etc., for such training, is about \$1000. The minimum salary paid teachers of domestic science in the public schools is \$500 a year, with the maximum about \$2400. The demand for graduates from the domestic science schools still exceeds the supply and the kind of teaching offered varies from that of a teacher of cookery in the public schools and that of a dietitian who controls the diet kitchen in a hospital and teaches the nurses, to the housekeeper and public demonstrator. The number of subjects the teacher of Home Economics is called upon to teach is large, including any or all of the sciences, most of the arts, hygiene, household management, nutrition, etc.

One of the common difficulties confronting the instructor of Home Economics is the application of a science to the home problems, with students who have had no scientific training. All the help a teacher receives from the authorities is a stating of the problem, often indefinitely. For instance, some theorist or even a practical but not scientific school director wants the girls in school to have a course in the chemistry of cleaning. The Home Economics teacher with a full schedule and no accepted course to follow, must meet the problem as best she can. The chemistry of cleaning is, by the way, much more easily adapted to the limits of the class-room and time schedule, than are many other important household problems. Home Economics is in so unformed a condition as to offer great interest and scope for original work, especially in organizing and directing the details for class procedure and presentation.

Is the teacher of Home Economics a philanthropist? All economists teach that on the welfare, morality and health of the family depend the strength, solidity, and influence of the nation. The Home Economics teachers should be able to apply to the home the knowledge imparted by the other instructors. If she is the right kind of woman, she will soon be the adviser in many homes, for their problems will be brought her by the children from the mothers and by the mothers themselves. She is in a position to improve the sanitary conditions of the neighborhood by awakening public opinion, and all this is being done in a quiet way by every domestic science instructor who is at all true to her vocation.

The classes come to the Home Economics laboratory and class-room with strong interest. It is the very rare girl who is totally uninterested in the home problems or does not enjoy the activity of the laboratory. In a recent article¹ by Miss Elizabeth Kemper Adams she says:

"This leads me to the second way in which academic life of the college fails psychologically in the response called for in class procedure. It may be called a failure in method. In the first place, the class-room stimulations and responses are heavily of one type—the verbal, through speaking, reading and writing, seldom through other forms of action.

"The psychological processes involved are to a great degree those of acquisition, retention and reproduction, listening to lectures that lead to examinations. It is a closed circle, in which the student gives to the teacher and to the class what they already know or are supposed to know.

¹ *Educational Review*, 39 (1910), No. 3, p. 247, *The Psychological Gains and Losses of the College Woman*.

"It has been said that under no other circumstances would human beings submit to such intolerable boredom. All this vast and painful labor is supposed to be for the purpose of equipping students to meet in the best way the various experiences of life after leaving college. It is rather like giving a workman the tools of a skilled artisan and telling him to store them carefully until they become blunt and rusty."

Home life, food, clothing, spending one's income, are so much a part of life even during school age that the responses to the interests awakened in the Home Economics classes are prompt and the problems adaptable to the class room. If solved, the information is immediately useful to either the student or her family. Often the problem is only partly solved in the class-room and the interest of the discoverer is given to the work. With this interest comes the realization to the student of the necessity of drill to gain skill and speed in manipulation.

The teacher of Home Economics whose pedagogic training equals her scientific knowledge has an unbounded opportunity for educational work in a variety of directions.

It seems to me the future of the profession of the teaching of Home Economics now depends upon thorough training in psychology and in class-room methods and management. When the Home Economics instructor shows teaching skill equal to that of other teachers, her place, importance, and value to the school will be inestimable. The very importance of the training and the immediate use of the work present dangers to the school, and more thoroughly trained, sound thinkers familiar with the work, are needed to fix the scope and place of Home Economics in the average school curriculum.

These and many more possibilities add to the interest of the Home Economics teachers' work, give dignity to the profession, and prevent monotony.

METHODS AND DEVICES IN HOME ECONOMICS AS USED IN ROCKFORD COLLEGE.

MARY DAVOREN CHAMBERS, A.M.

Head of Department of Chemistry and Home Economics.

Though the problem of home management includes food, shelter, and clothing, and though our course is designed to cover all these phases of Home Economics, yet more and more every year do I find the food problem to dominate in importance. Hence, in this synopsis of our work in Rockford College, I will deal solely with the subject of food and nutrition.

Every year I find it necessary to vary the course—often to revolutionize it—adapting it to changes in the personnel of the class; to changes in the times, though the dominant thought of the times is always an economic one; and to changes in my own wish to emphasize, to accentuate, now one point, now another. Hence, though I shall attempt to describe the work as it was given last year, only one thing is absolutely sure about the work of next year, that of necessity it will be different.

We began our laboratory work by comparing raw tomatoes with baked tomatoes, raw bananas with baked bananas, baked potatoes with boiled potatoes, baked apples with steamed apples, and raw eggs and raw meat with eggs and meat cooked at different degrees of temperature. We found one generalization applicable to all the varying results, namely, that heat develops flavor, and that within limits the higher the temperature the more pronounced is the flavor. This, which may be called the fundamental principle of cookery, is at the basis of all our future work. Change in texture is also noted. Some original problems were given, *e.g.*, the students were asked what general methods they would use in the cooking, respectively, of sweet corn, peas, squash, onions, cabbage, and beets, in order to attain their aim, the lessening or the development of flavor in the dish. This work covered several lessons.

Next we studied the reaction of various foods to some of the "re-agents" used in cooking, *e.g.*, water, acids, salts and sugar. We

boiled rice in our hard city water and in distilled water; we cooked potatoes, corn, and beans in strongly salted and in unsalted water; we cooked apples or preserved berries in water alone and in a heavy syrup; we used vinegar in making a ragout of tough meat. Original application is always demanded of the principles learned.

"Surprises" often meet the students on assembling, as when the question is asked, "How many of you drank coffee this morning at breakfast?" "What time did you drink it, at the beginning or end of the meal, or together with your muffins and eggs or bacon?" "Now let us see whether you ought to drink coffee until you are as old as I am, and having reached that age, at what time during the meal you should use it, and whether the time of taking coffee is a matter of any special importance?"

Chemistry and physics are correlated at every possible point. In the application of physics, the field is very broad; the various methods of applying heat to food, the conducting properties of various media, *e.g.*, dry or moist heat, the iron or the enameled skillet; why the iron gem pan brown the gems better than the agate gem pan, why the soapstone griddle need not be greased; whether the cake shall go on the top or on the bottom shelf of the oven first; why quick baking causes the muffins to run up into a point in the middle; where to place milk and onions in the same refrigerator—all these are questions to which physics can be made tributary. I have known some students to try to use coefficients of expansion in baking a pound cake and feel greatly the better for the exercise, at least. Of course they found, as the teacher long ago learned, that the mixture of food materials used in the food, prepared in the kitchen, does not usually expand according to coefficients of expansion calculated for one or two of its ingredients. However, the attitude of mind which tries to solve home problems by the aid of scientific data is worth cultivating and the student can be led to consider other and more possible and practicable applications of physics. Physical laws can be cited in accounting for the loss of nutrients by the process of osmosis in the "floating" or "fattening" of oysters in fresh or brackish water and in the removal of an excess of salt in the freshening of salt ham or fish by soaking and in numerous other household matters.

As a part of their work the students made fondant, this exercise coming soon after their elementary study of oxidizing and reducing agents in their chemistry class. On being asked to apply Trommer's test to the solution of the fondant and of the cane sugar used in making

it, they were able intelligently to observe that if a little cupric salt were added to the test tube containing the fondant, it would be changed to the cuprous form. Since nothing was present but the candy to cause this change the cooked fondant may be inferred to have acquired properties which the original sugar did not possess. On repeating the test using molasses candy, vinegar taffy, and some other forms of inverted sugar the generalization was reached that heat and water, or better heat and acids, acting on cane sugar, change more or less of it to a sugar which will reduce certain metallic salts in solution. The similar action of ptyalin on starch should be pointed out. All these observations can be made to lead far into the chemistry of the groups of sugars and the facts of carbohydrate digestion.

By the study of such everyday problems as how to clean a smoked asbestos mat, when to use agate or enameled utensils instead of ordinary iron or tin, how to raise the temperature of the inner contents of a double boiler, whether or not to use water from the kitchen boiler when making tea, how to prevent the discoloration of fruit after paring, how to devise freezing mixtures, etc., the students can be readily taught to appreciate the scientific factors involved and reach a reasonable solution.

In connection with the work in botany a study of the composition and structure of the vegetable products used as food provides material for broad application. For instance, the reason why the best part of a potato is commonly considered to be that nearest the skin may be explained by comparing the potato with a branch. The outer part of the potato would then correspond to the phloem region of a branch which is particularly rich in the nutrient material required by the plant for its growth and development. The classification of potatoes with the Solanaceæ, a family containing poisonous members such as the nightshade, may serve as a striking example of the fact that closely related plants may differ widely in their properties and that some which are originally unpalatable or harmful, may be so changed by selection and cultivation that they are wholesome and valuable. In the case of potatoes, the circumstances should also be considered under which a poisonous constituent, solanin, which would normally occur in the green plant, may be feared in the tuber if the potatoes are not rightly grown or rightly cared for, though it should be said, in truth, that the danger of solanin poisoning from potatoes is remote under ordinary circumstances. The tomato and eggplant may also be spoken of as interesting examples of plants of the same family as the potato which are wholesome articles of food, though in

each case harmful attributes have in the past been attributed to them, as for instance, by the persons who fancied some connection between tomatoes and the occurrence of cancer.

The above are some of the applications which can be made of the facts of botany. If the students should happen to study cryptogams at the time of the bread making lessons, that is, if the botany instructor touches on yeasts, molds and bacterias in the study of cryptogams, the student should be able to set a bread sponge with a better knowledge of what the use of yeast involves than would otherwise be the case and to have a better knowledge than otherwise of the nature of the ingredients which she must use to obtain good bread. The applications of data usually included in the students' work in bacteriology, including the processes of fermentation and sterilization to cooking problems, are obvious and need not be dwelt on further in this paper.

Physiological chemistry is one of the branches of science which may be made of the utmost help to the teacher. It is sometimes said that a cereal food at the beginning of breakfast indirectly prepares the stomach for the reception of steak or eggs which may be eaten afterwards. A reason commonly given is that the alkaline saliva introduced in the stomach as a result of masticating the cereal stimulates the abundance of secretion of the acid gastric juice. In the same way if the question of the reasonableness of such a combination as apple sauce and pork arises, a usual answer is that acids stimulate the secretion of the bile and bile acids which are needed in the digestion of fats. Before accepting such lines of reasoning, which were perhaps as reasonable answers as could be given a few years ago, the pupil should be made familiar with the results of the careful studies of the digestion which have been reported by Pavlov and others and should be taught something of the mechanism of digestion as explained by this work and something of the function of both psychic and chemical stimulants in the process of digestion.

From the attempt to make rennet custard in various ways the question may arise as to why rennet custard fails to solidify perfectly when made from a cup of cocoa in which the milk was necessarily cooked when the cocoa was made. Facts from physiological chemistry indicate that for the clotting of milk by rennin as well as for the clotting of blood by another enzyme the presence of lime salts in definite combination is necessary, and in the case under consideration these have been precipitated, that is, the right chemical combinations have been more or less upset in the boiling of cocoa before it was used for the custard.

Of course in all such work the students must be taught how difficult it is to be sure that one has all the facts needed to answer the question and must realize that the conclusions one can reach must in the nature of things be simply the best explanation one can offer in the study of problems which involve many matters which are very commonly still under investigations in the laboratory. In this way the danger of fostering the habit of hasty generalization may be avoided.

The student should also be impressed with the fact that inability to give definite answers to all questions which can be raised does not mean that they are useless questions or that the usual works of reference are silent on the matter either out of wilfulness or out of ignorance. It should rather be made clear to them that although it is only recently that the general subject of these home problems has received scientific study, yet much knowledge has been accumulated and additional information is accumulating rapidly, so that we may well hope that the mystery of yesterday may be the commonplace of tomorrow just as fermentation was a mystery until Pasteur and others made it clear to all.

The subject of dietetics covers an hour a week for three semesters and involves the study of the problems of diet for the normal adult, for the growing child, for the aged, and for the sick. Types of all common foods are studied from a chemical, physical and economic standpoint; in other words, from their protein content, their energy value, their utilization by the organism and their cost as related to their other qualities. Questions of composition are made familiar by the use of series of charts, graphically illustrating the proper amounts of materials representing water, protein, fats, carbohydrates and ash in the common food materials.

As an illustration of the bearing of other matters besides composition upon the relative value of food, the student compares the volume, cost, composition, and energy value of a pound of milk and a pound of oysters as follows:

Relative cost and nutritive value of milk and oysters

KIND OF FOOD.	VOLUME.	COST.	PROTEID	FAT.	CARBO-HYDRATES.	ENERGY.
	<i>Pints.</i>	<i>Cents.</i>	<i>Ounces.</i>	<i>Ounces.</i>	<i>Ounces.</i>	<i>Calories.</i>
Milk	1	.025	1	0.65	0.75	375
Oysters.	1	.20	1	.20	.50	225

From this comparison it may be seen that if we buy oysters we pay 20 cents for approximately the same amount of nutritive material which can be obtained for $2\frac{1}{2}$ cents spent on milk at the prices assumed. What then justifies the purchase of oysters? Shall one pay $17\frac{1}{2}$ cents extra just for the oyster flavor? It can be made clear to the pupil that something else is involved; for milk is well worthy of being regarded as a staple food when one recalls the numerous ways in which it can be used alone or in combination with other foods. It is for this reason that milk would naturally be used in our diet so much more abundantly than oysters even if the two were of the same cost as well as of approximately the same nutritive value pint for pint. The question of value involves other considerations, such as the psychic stimulation already referred to and what has been termed the "psychic income" of the newer school economists, that is, the pleasure-yielding property of delicate flavor. This is perhaps a new way of referring to an old idea for it seems literally as well as figuratively true that "man may not live by bread alone."

Pursuing the comparison of milk and oysters it may be pointed out that milk lacks the nucleo-proteids, chemically related to the purin bodies, which should be avoided by victims of uric acid while oysters contain these bodies, but if these matters are brought out the student should also be told that this whole question of uric acid-yielding bodies is regarded by the physicians as a problem of invalid dietetics rather than a problem for persons in normal health. The comparison of oysters and milk, however, may serve to introduce the question of acid-forming and base-forming elements of foods as set forth in the work of many physiological chemists, including among others the results of investigations which have been published by Prof. H. C. Sherman of Columbia University.

From the whole discussion we may decide that there is a time for milk and also a time for oysters as well as for sweetbreads, asparagus, and other more or less costly dainties, and that in the intelligent selection and combination of foods of different properties as well as different costs lies the art of preparing an acceptable and wholesome menu. These conclusions perhaps can not be said to be radically different from those which have been reached long ago without all the "labor and pain" of laboratory research and study, but at least it may be said that when they are thus reached we are better able to give a reason "for the hope that is in us."

Although in this study of the subject dietaries are planned by the

students for persons of different ages, occupations and income, care is taken to show them that, so far as everyday living is concerned, it is not essential that the diet should correspond absolutely with some dietary standard but rather that it should be in reasonable accord with such a standard when considered in long periods. Furthermore it is true that the calculation of the nutritive value of a diet affords the most convenient method of learning its character and may serve as an important basis for the selection and combination of foods in a reasonable way. If it were not for such uses, calculating the value of a diet would be little better than an academic exercise. Man's physical and mental nature is very complex and many factors influence the relish for different foods as well as their digestion and assimilation. It is, therefore, more important to understand the broad principles of dietetics than to attempt to acquire a set of rules for guidance in this important part of the household problem.

A LESSON IN COOKERY IN THE ELEMENTARY SCHOOL.

MRS. ALICE P. NORTON and MISS JESSIE P. RICH.¹

Colonel Parker used to say to his faculty something like this: "I have no patience with any teacher who goes before his class without careful and detailed preparation for his lesson; and I have as little patience with one who really teaches as he had planned."

To make a plan for a cooking lesson is comparatively simple; to tell just what questions will be actually asked, what direction the discussion will take, how far the suggestions of the children will lead one, is quite another matter. To attempt to put in static form anything so dynamic as a cooking lesson almost necessarily means a failure to reproduce its real and vital points.

While the dish to be cooked remains as it was planned, the discussion of the how and why often leads to the emphasis of points or the trying of experiments that were not in the mind of the teacher to begin with. To inspire the children to express what lies within their own experience, to gain from them suggestions as to methods of work, to select from the many suggestions those that are really worth attention, to determine by discussion or experiment what ones are practical or preferable, all this means the power of adaptation, alertness, and good judgment. The inspiration for the best teaching must come from the stimulus of actual contact with the children.

In the elementary school of the College of Education of the University of Chicago, a lesson generally consists first of science work that forms the preparation for cooking, then of the actual carrying on of the cooking process, followed either in the cooking laboratory or the class room by the writing of the recipe used, usually in the words of the children. This by no means ends the matter, however. Frequently a whole series of science lessons is undertaken to answer questions that have arisen in the cooking laboratory, while reading lessons, number lessons, and writing lessons also find their inspiration there. The work is interwoven with almost every other subject in the school.

¹ Read at the Boston Meeting of the Educational Section of the American Home Economics Association, July 5, 1910.

The preparation for the lesson is often done on a different day from the cooking, since our periods are short. A lesson is here chosen that might be given to either the fifth or sixth grade.

The work of our fifth grade centers about colonial cooking, and has a direct connection with the history of that year. The children take up the typical food products, study their production and preparation, and in so far as possible, put themselves in sympathy with colonial times. Possibly more time is spent on corn as the staple article of diet than on any other one food stuff. Its use in the early period is contrasted with that of the present, and its value is compared with that of wheat. In discussing the various uses of corn meal the making of the breakfast muffin is mentioned by the children as a present use in many of their homes. When a little later, they begin some study of doughs and batters, and come to the making of muffins, they wish to try in them the substitution of corn meal for flour. The question then as it is presented to the class is this: Can we make muffins by using corn meal in place of flour? The problem is approached in various ways by different classes. One class proposed the following steps of investigation. First, we must know the requirements of a good muffin. Second, we must know how it is made. Third, we must try substituting corn meal for the wheat flour in the recipe. (A question here brought out the advisability of substituting by weight rather than by measure.) Fourth, we must compare the corn meal and the white flour muffin and if the corn meal is not so good as the other see if we can tell the reason by finding out the difference between white flour and corn meal.

Another class might approach the problem in this way: (1) Is corn flour like white flour? (2) How do they differ? (3) Will this difference prevent corn meal from making as good a muffin as white flour? (4) What special difference caused the difference in results if there was one?

Either method of approach brings out practically the same facts and calls for the same set of experiments. The first order of procedure seems somewhat preferable for a younger class as it brings the cooking first, and uses the experiment for the explanation of the results. With an older class it might be better to use the experiment to lead up to the cooking process. The lesson is here discussed with the first order suggested.

The knowledge available is that brought from daily experience at home, with some knowledge of proportions obtained from the making

of thinner batters. This information is gotten at and summed up by such questions as the following: Can you describe a good muffin? What materials are used in making muffins? (The list suggested is put on the board, and the essentials selected.) Will the mixture be thicker or thinner than the griddle cake? How much more flour will be needed?

The general proportions for muffins, formulated as far as possible by the children, are put on the board by the teacher as follows: 2 cups of flour; 4 teaspoonfuls baking powder; $\frac{1}{2}$ teaspoonful salt; 2 tablespoonfuls sugar; 1 egg; 1 cup of milk; and 2 tablespoonfuls melted butter. Further questions are then asked, such as these: Why are the materials so grouped? How will you combine them? Why? What is going to make the muffins light? What recipe shall we use for the corn meal muffins?

Weighings are made to determine the comparative amounts, and it is found that $1\frac{1}{2}$ cups of corn meal will take the place of 2 cups of flour.

The directions are written on the board, and the recipe divided, each child making a sixth, three or four using the corn meal, the rest making the white flour muffins. When the muffins are baked, a careful comparison is made of the two kinds. Those from the corn meal are found smaller, drier, less light, and very crumbly. An attempt is then made to see if any differences in the two flours can be found that will account for this. (Some or all of the following experiments may be used.)

Dough equal amounts of the two flours and wash in a bowl of clear water. A sticky elastic substance is found in the white flour. Possibly this substance is the cause of success in the muffins. Is it found in the corn? A few experiments to find its nature and value may be tried, as follows:

- (1) Through a glass tube blow into the gluten.
- (2) Drop a moist piece into hot deep fat. Try the same with moistened corn meal.
- (3) In one glass mix a measured amount of flour and water, in another an equal measure of starch and water. Now pass into each a gas (carbon dioxide generated by acid poured over marble chips).
- (4) Mix together baking powder, flour and water in one dish, in another baking powder, corn meal and water. Make a griddle cake from each. Notice and compare results.

In each case it will be seen that though gluten is not what makes foods light, it is capable of stretching and retaining a gas.

To return to the original question—Can we make muffins by putting corn meal in place of flour? We did not succeed; but we have corn meal muffins at home. How are they made? Perhaps we might use corn meal instead of part of the flour, leaving enough flour to furnish the necessary gluten. Some child might suggest the use of more eggs.

If the interest of the children has been sustained, a lesson may follow in which the substitution of corn meal for one-third, one-half, and two-thirds of the flour may be made and the results compared, till the proportions for the best muffins are found.

This by no means closes the work on gluten or flour or the lightening of doughs and batters. Instead it opens up many questions for further study.

It seems impossible to put the work on paper in a way that shows its interest and meaning. It is certainly true that the children respond to it with an enthusiasm and a suggestiveness often absent in other types of work. The boys especially respond with many questions about the why and the wherefore. This is often shown in their own accounts of what they have done. An illustration of this is given in the following paper by a fifth grade child summing up a different lesson, but one also involving experimental work:

We started out to make grape jelly, when some one asked whether it could be made without sugar. We tried many different ways. Some of us made it without any sugar, and some with one-fourth as much sugar. All jellied. I got four-fifths of a wine glass of jelly, using half a cup of juice and one-fourth of a cup of sugar.

One basket of grapes cost 20 cents; three-fourths of a basket of grapes cost 15 cents; we used three-fourths of a basket. There were fourteen children in the cooking class that day, and each one had half a cup of grape juice. One cup of grape juice cost $2\frac{1}{2}$ cents; one-half cup of grape juice cost $1\frac{1}{4}$ cents. In grape jelly there is also the sugar. The sugar cost $\frac{1}{2}$ cent and the sugar and juice together cost $1\frac{3}{8}$ cents.

HOW TO APPLY THE LABORATORY METHOD OF STUDY TO PRACTICAL COOKING IN HIGH SCHOOLS.¹

CARLOTTA C. GREER.

Technical High School, Cleveland, O.

To develop reasoning power chemistry, physics and mathematics are used, but the textbooks were prepared by men to interest boys. Why should not girls' activities be utilized to interest them in the same principle, but with a different application? Girls as a rule are considered very unsatisfactory students of chemistry and physics, I once heard an instructor in chemistry say he had such a fine class this year, "all boys, not a single girl to bother with."

Problems involving terms of her experience and environment would certainly claim the girls' interest—I am quite sure that sugar and spice would be far more attractive to her than prisms, cones, and partial payments. In the Cleveland Technical High School, girls solve problems involving the cost of foods; the relation of the nutritive value to the cost of food, and the method of preparation; comparison of one method of cookery with another, as to economy of time and fuel; division of quantities used in the ordinary recipe, in order that the student may appreciate the relation of the individual to the practical quantities; formation of recipes; and questions in household hygiene.

Data for these problems are obtained for the most part from observations and measurements made in the school kitchen. While skill is being acquired in preparing a food material in the kitchen laboratory, valuable information concerning the same food is received from propositions and solutions of mathematical problems. By way of illustration, a few of these applied problems are here reproduced, as follows:

(1) Coffee sugar is 98 per cent pure sugar, while granulated sugar is 100 per cent pure sugar. Coffee sugar costs $5\frac{1}{2}$ cts. and granulated sugar 6 cts. per lb. Which is the cheaper?

¹A condensation of a paper read at the Boston meeting of the Educational Section of the American Home Economics Association, July 8, 1910.

(2) Granulated sugar sells at 6 cts. per lb., or \$1.45 for 25 lbs. If a family uses 4 lbs. of sugar per week, how much can be saved in a year by buying it in twenty-five pound quantities?

(3) A can of dried beef cost 15 cts. and contained 4.6 oz. of meat. Dried beef in bulk sold for 35 cts. per pound. How many ounces of beef in bulk could be purchased for 15 cts? What percentage is saved by buying it in bulk rather than in cans?

(4) A grown person needs 3000 cu. ft. of air per hour. If a room 14 by 12 by 10 ft. were occupied by one person, how often would the air have to be completely changed to obtain pure air?

(5) According to Fisher, one large egg and one shredded wheat biscuit each yield 100 calories of energy. The dietary standard for a girl of twelve years is 1276 calories. Assuming that the food at breakfast should produce one-third of this quantity, what part of it will be supplied by the biscuit and egg?

(6) How many potatoes are cooked in your home per day? There are 144 medium-sized potatoes in a bushel. How many bushels of potatoes are used in your home per month? When potatoes sell at 80 cts. per bushel, how much is spent for potatoes in your home during a month?

(7) A loaf of bread weighed $15\frac{1}{2}$ oz. but after the crusts were removed it weighed $14\frac{1}{2}$ oz. What percentage of the loaf was crust? If bread costs 5 cts. per loaf, what is the cost of the crusts? If a family uses 3 loaves of bread per week for toast from which the crusts are removed, how much would the waste amount to in a month, if the crusts were not utilized for other purposes? What percentage of the cost of the loaf would be waste?

(8) The proportions of baking powder, fat, moisture, and salt to flour, and of eggs to baking powder for batters and doughs are stated, then such a problem given as the following: Write a recipe for waffles, making them economical as well as palatable when eggs sell for 45 cts. per dozen, using 3 cups of flour for the basis.

(9) Counting fuel and cost of materials, 4 doz. cookies can be made for 31 cts. At the bakery cookies cost 10 cents per dozen. Find the difference in cost between "home made" and "bakery" cookies. To mix and bake 4 doz. cookies at home requires 2 hours. If a woman can earn 15 cts. per hour, is it cheaper for her to buy or make cookies? How much cheaper?

(10) Pea soup to serve six can be prepared from 1 can of peas costing 12 cts. or from 1 cup of split peas costing 6 cts. per lb. (1 lb. split

peas measures 2 cups). Fifteen minutes are required to cook the canned peas, and $3\frac{1}{2}$ hours to cook the split peas. The simmering burner on which these goods should be cooked consumes 3.6 cu. ft. of gas per hour; gas costs 75 cts. per 1000 cu. ft. Which kind of peas is it cheaper to use?

An attempt is being made in the Cleveland High School to teach girls to cook by having them do much cooking and at the same time treat processes of cooking as experiments of an ordinary scientific subject. Writers of laboratory manuals of exact sciences aid beginners in developing skill in manipulation and powers of observation by not only giving directions for the methods of preparation of a substance, but also by inserting suggestions and questions which will cause the student to look for changes and draw conclusions as to their cause. In preparing oxygen, the student writes in his note book the method of preparation, and the appearance, properties, and behavior, when different materials come in contact with it. Our methods of teaching are analogous to those used in science laboratories, in that directions for methods of cooking foods are given, then suggestions and questions are added to aid the student in comprehending what she is doing and what is taking place. The observations made are recorded in a note book. In arranging our practical lessons, we have given such directions and questions as to have the student observe changes in foods as heat is applied, and make a comparison of one method of cookery with another, including the relative nutritive value from two methods of cooking the same foods.

A lesson on boiled and steamed rice, for instance, includes such directions as these: Compare the quantity of water used for boiling and steaming rice. Why is a larger amount used for boiled rice? How is rice tested for sufficient cooking? Why does it take rice a shorter time to cook than most of the wheat and oat foods? Test the water from boiled rice with iodine for starch. Which method of cooking rice leaves the more nutrition in the cooked product? What is the difference in appearance of steamed and boiled rice? What ingredient does rice contain which makes it possible to mold it? Which is better for molding—steamed or boiled rice? Why?

Here is a lesson on plain and whole-wheat biscuits in which some were made by using one-half cup of fat, and others by using two table spoonfuls of fat. Compare biscuits made with little fat, as to texture, appearance and taste, with those made with a greater quantity. What is the effect of increasing the quantity of fat? How much flour

was used for biscuits in this lesson? How many biscuits were made from this quantity? Note the quantity given in the practical recipe. How many biscuits will this make? Tabulate the chemical composition of white and whole wheat flour. On the basis of the table, which is the better tissue builder? Why? What is the weight of a sack of flour of ordinary size? How many cupfuls are contained in one pound of flour? What is the present market price per sack?

If a lesson is given in which it is necessary to do a little experimenting, aside from practical cooking, the students not only perform the experiment, but in a methodical way record the procedure, giving process, result and conclusions or practical applications of the experiment. Only such experiments are given as will demonstrate principles which can be directly applied to methods of cooking or digestion. The application is always made at once by practical work. During the first year, special stress is placed upon the function of foods and their digestibility to correlate with physiology and botany—the sciences required of freshman girls. From a lesson on sugar in which different kinds of sugar are dissolved that the student may comprehend what solution is, the application is at once made to digestion by developing the fact that digestion involves solution, and all foods must be dissolved or changed by a somewhat similar process before they can be assimilated. Experiments, when the subject of fat is given for a lesson, have later proved quite helpful to the immature students in getting some notions of fat digestion.

During the first year of the Cleveland Technical High School, there was a class of girls in applied chemistry who had had no training in domestic science. The work of this class and of the succeeding class to which one year's work in domestic science had been given was compared, and the conclusion made that the students of the second class were much more apt in grasping scientific study. It would seem, therefore, that we have somewhat accomplished an aim in not only teaching girls to cook, but in also laying the foundation for the laboratory method of study. If so, this is no small accomplishment. Obviously it is impossible for any school room to furnish the same environment or for any student to experience the same conditions as will be found in the various homes. The best the teacher can do to train the student to fill the responsibility of home keeping is to give her definite instruction in methods of housewifery and at the same time train her intellect to such resourcefulness that she may be able to master any situation, however trying.

HOW TO TEACH THE PREPARATION OF MEALS.¹

FLORENCE WILLARD.

Washington Irving High School, New York City.

Many of the pupils who reach the high schools have had work in domestic science in the elementary school and the practical part of the course is sometimes a problem. As far as the mental development is concerned, the high school pupil is not very far in advance of the elementary pupil, and in the first years is not ready for experimental work in cooking. But psychologically she differs. She no longer cares to cook only one muffin or to boil one potato; she is no longer content to scrub and clean. She wants to feel that the work is in advance of the elementary work.

The pupils come to us with a fair knowledge of foods and the general methods of cooking. It seems to me that it is best to take advantage of this, and use the knowledge in the combination of foods for simple meals instead of going on in the realms of fancy cooking.

The usual cooking period is from 90 to 120 minutes long. To cook a meal in this time in a school kitchen is a difficult problem. It can be done, however, if carefully planned.

Most of the menus will have to be talked over in a previous lesson. At first they should consist entirely of things which the pupils know how to cook. When the pupils enter the room the menu should be on the black board, and the recipes written on the board or type-written copies distributed.

There is no time for a lecture at the beginning of the lesson. A few general instructions will be necessary, but the pupil should begin work at once.

The proper distribution of supplies is most important. I have found that placing supplies in groups, where not more than four or five pupils use them, expedites matters a great deal. All lessons should finish in time for the pupil to compare and record results.

As has been suggested, begin with a simple menu. A breakfast is the best meal. The menu has been planned and consists, for example,

¹ Read at the Boston Meeting of the Educational Section, of the American Home Economics Association, July 6, 1910.

of stewed fruit, cereal, toast, eggs and coffee. Divide the class into groups of four or five, depending upon the size of the class. Have each group cooking one thing, using proportions large enough to serve the entire class with small servings. All this can be easily accomplished in the first lesson, but there will not be time to serve the breakfast properly. The serving of these breakfasts at the end of the cooking lesson amounts to each pupil setting an individual place for herself and being served by one pupil from each group.

A lesson should very soon be given where nothing is cooked, where the whole stress of the lesson is placed on the serving and where the pupils go through the actual process. Parts of the class act as host, hostess and guests, others take turn as servers. Lessons should also be given illustrating the home life where no maid is kept and no one person serves, except perhaps a younger member of the household.

At least three lessons should be devoted to cooking breakfast where the class is divided into groups of four or five. Change the arrangement each time, so that pupils who cook cereals one time cook eggs another, and so on. Follow these lessons with three lessons where the pupils cook in groups of two, with amounts large enough for two people. Change the menu each time, having a different fruit, different bread, etc. Do not change the method of cooking, however, except perhaps for the eggs.

Each pupil should now be ready to prepare a breakfast alone, using, for economy only, individual amounts. Two lessons are necessary to make each pupil thoroughly confident that she can prepare a breakfast entirely by herself. It is a good plan to follow this with a test breakfast, cooked and served for six people, dividing the work evenly among the pupils, the teacher being among the guests and giving no help whatever.

Luncheon, being another simple meal, should next be taught. Begin as with the breakfasts, cooking in groups of four or five. Have the menu consist of cream of vegetable, lentil or split pea soups, biscuits, or some hot bread, and a beverage. Three lessons should be given where the pupils cook in groups of four or five, three lessons in groups of two, and two lessons where each pupil cooks alone. Vary the menu to include simple salads. Bread and rolls can be reviewed in the luncheon lessons if the classes work in rotation, one class making the dough, another baking it, etc.

The fancy methods of cooking vegetables, fried tomatoes, corn fritters, stuffed peppers, and fancy egg dishes, may be readily taught for the luncheon dishes.

Suppers are so nearly like luncheons that they follow next in order. Drop the soup from the menu and add a simple dessert, like cake, combining with the cake some of the preserves that adorn all of our exhibit cases. The biscuit dough may be turned into short-cake, Dutch apple cake, etc. As is always the case in cooking entire meals, there must never be but one new dish in each lesson.

Dinner, the most elaborate meal and requiring the greatest skill, is taken up last in the group. Here, if the classes work in rotation, a soup stock can be prepared by a previous class and used in the following classes:

The dinners will have to include the meat lessons. Begin as before, working in groups of four or five, then in twos and then individually. At the end an examination dinner should be cooked and served by the entire class. If the dinner of the day is to include broiled steak, and the pupils are working in groups of twos, cut the steak into two-inch squares, and have each two pupils broil the small pieces over the individual stoves. The same plan works with the roasts. Cut a roast into small pieces, divide them among the pupils, and have each pupil season and roast her piece in a small pan. Liver may be braised in this individual way surrounded by vegetables.

The soups, the desserts and the salads should all be reviews of the lunches and suppers. The constant repetition prevents cooking a great variety of dishes. The value lies in the pupil's being absolutely familiar with all the dishes prepared.

The clock must be constantly watched to accomplish the program planned for each lesson. One must work against time. Gauge the time it should take to accomplish a certain amount of work. Tell the class that it must be done in that time. This spurs on the slow pupils and keeps back the hustling, careless ones. If a class learns to work together much more can be accomplished. We work for speed in the Washington Irving High School in New York, and have many exercises called "speed tests." The first pupil to finish has the highest mark for speed and she is almost invariably one of the neatest and best workers as well.

Half of the women to-day spend too much time in housework; working slowly is a bad habit to contract. We all know housekeepers who have beautifully well managed and clean homes, and yet have plenty of time for outside work and social enjoyment. We also know housekeepers who are eternally at work and never have time for anything but to complain. We do not wish to train housekeepers of this type.

The cost of materials in teaching meals is an item to be considered. While it costs ordinarily two cents per pupil a lesson to teach domestic science, I have found that teaching meals in this way costs four cents per pupil a lesson. We have tried occasionally serving the meals to teachers and thus lessening the expense. That is only practical with the mid-day lesson, and the pupils always are disappointed, so we have not done much in that line. We never have any trouble in disposing of the food cooked; our pupils are always hungry. Most of them, if they get the chance, will eat their luncheon before ten o'clock.

It is often amusing to note the kind of food that is suggested when the menus are being planned. The most popular article for breakfast is chocolate cake. If one can stand it, I suppose it furnishes more calories than a roll, and is not any worse than pie; but as the average stomach cannot stand pie and cake for breakfast we endeavor to teach them that rolls are better. The dessert they always wish is ice cream, and although the Hebrew is not allowed oysters, "oysters on the half shell" is apt to be inserted in any menu written by the girls. "Demi-tasse" is always popular, and that no meal should ever be served without seltzer seems to be a rule in many households.

One of the advantages when entire meals are cooked is the skill that is acquired in manipulation. It is not of great value to know how to cook only one thing at a time, for the successful housekeeper must literally have many irons in the fire. She must learn to calculate for each dish that is to be cooked. Things must be started in proper rotation. The average pupil will prepare the coffee before the cereal, but she doesn't do it more than once. Preparing meals in the school kitchen also teaches economy in the use of cooking utensils, which is a valuable habit to acquire.

The planning of the meals reveals to our foreign pupils what Americans eat, and what they can conveniently buy. They cannot find their native foods here, and when they substitute American foods at their own discretion, they make many unhealthful combinations.

The home work during the entire course calls for the study of prices and amounts needed to be purchased. The recent meat wars in New York have made my pupils very keen on the cost of foods, especially substitutes for foods like meat at its present prices.

After pupils have an idea of what a meal should consist, a good basis has been formed to work out the actual amounts needed by the calorie calculations.

THE USE OF THE 100-CALORIE PORTION AS A CONVENIENT MEANS FOR CALCULATING THE FOOD VALUE OF A GIVEN DIET.

RACHEL H. COLWELL.

To Professor Fisher of Yale is due the suggestion of the 100-calorie portion. He has worked out¹ tables giving the weight, the approximate bulk and the calories derived from protein, fat, and carbohydrates in a 100-calorie portion of some of the common foods. By weighing and then measuring in the laboratory some of these 100-calorie portions we can obtain a practical notion of the relative calorific values of the different foods.

The use of these results enables us to approximate rapidly the number of calories of the food served at a given meal. As an example, take a breakfast, consisting of one large orange, one shredded wheat biscuit, $\frac{5}{8}$ cup of milk, one large egg, one thick slice of bread (sufficient for two slices of toast), one tablespoon of butter for the toast, and five teaspoons sugar. Each of these items contains approximately 100 calories, making a total of 700 calories.

If it is desired to arrange a breakfast menu for six people it is merely necessary to take six 100-calorie portions instead of one.

Often one wishes to know the relation of the calories derived from protein to the total calories. That, of course, requires some calculation, but it can certainly be done more rapidly by this method. Let us take as an example the breakfast before us. In the case of the orange the table gives 6 calories from protein in a 100-calorie portion. Since the nutritive ratio is the relation of the number of calories of protein to those from the other nutrients, $100 - 6 = 94 \div 6 = 15 +$, or the nutritive ratio of the orange is 1:15 +. Applying this to the whole breakfast and estimating the nutritive ratio of the entire meal for 6 persons instead of the individual portion, we have the results shown in the following table:

¹ Amer. J. Physiol. 15 (1906), No. 5, pp. 417-32; J. Amer. Med. Assn. 48 (1907), No. 16, pp. 1316-25; Bul. Amer. School Home Economic. Series 1, 1909, pp. 32.

Calculation by the 100-calorie portion method of the relative amounts of energy derived from protein in a typical breakfast for six persons.

KIND OF FOOD.	AMOUNT.	NUMBER OF 100-CALORIE PORTIONS.	TOTAL CALORIES.	CALORIES DERIVED FROM PROTEIN.
Oranges.....	6 large.....	6	600	36
Shredded wheat.....	6 biscuits.....	6	600	78
Milk.....	4½ cups.....	6	600	114
Eggs.....	6 large.....	6	600	192
Bread.....	6 thick slices.....	6	600	78
Sugar.....	5 teaspoons.....	6	600	—
Butter.....	6 level tablespoons.....	6	600	3
Total.....		42	4200	501

As 4200 total calories—501 calories from protein = 3699 calories and $3699 \div 501 = 7 +$, the nutritive ratio = 1:7 +.

The same use of the 100-calorie portion may be made in determining the number of calories in a recipe. Take as an example a custard:

Calculation of the energy value of custard from the raw ingredients by the 100-calorie portion method.

KIND OF MATERIAL.	AMOUNT.	NUMBER OF CALORIE PORTIONS.	TOTAL CALORIES.	CALORIES DERIVED FROM PROTEIN.
Eggs.....	6.....	6	600	192
Milk.....	4 cups.....	6.4	640	122
Sugar.....	½ cup.....	4.8	480	480
Total.....		17.2	1720	314

As 1720 total calories—314 calories from protein = 1406 calories, and $1406 \div 314 = 4 +$, the nutritive ratio = 1:4 +. If the custard served six persons, then each one had nearly three 100-calorie portions.

In conclusion it seems fair to say that we must get away from detailed calculations with pencil and paper in our dietary work if we would make it of such practical value that it can guide the housekeeper in the collection and combination of food material for the family.

HOW TO USE THE 100-CALORIE PORTION IN DIETARY TEACHING IN HIGH SCHOOLS.¹

MABEL WELLMAN.

In the first place we will suppose the class has had the usual training in cooking, understands what is meant by carbohydrates, fat and protein, and knows something of the chief functions of these as foods. In connection with the discussion of the use of foods to furnish energy there must be made clear that rather difficult point of what we mean by energy, the various manifestations of force, and how one of these can be transformed into another. If the class has had physics, they follow the idea readily, otherwise a good deal of illustration is needed. Then can be raised the question, to be answered by all the rest of the dietetic study—How can we know how much food to take, whether we have eaten enough, or too much, or if it has been made up of the right proportions of food materials?

That appetite is not and cannot be a safe guide can easily be established by a consideration of the way in which little children would satisfy their appetites if left to themselves. The class will readily see, too, that the amount of food necessary must differ from person to person with the individual need for energy: first, with the size of the body and the effect of temperature and clothing in influencing the heat loss; second, with the amount of work done, this meaning both amount of activity and the need of repair; and third, with age, since that modifies building requirements, repair and activity.

Now, we can suggest to the class the possibility of measuring all this in terms of heat, since a given form of energy is but one manifestation of force; then the measure of power to heat, or of fuel value, the large calorie, must be worked out. Next can be taken up the usual study of how we determine the needs of the body by both the statistical method and the "man-in-the-box" method. Whichever standard the teacher decides to give can follow at this point as usual—*only* the

¹ Presented at the Boston Meeting of the Household Arts Section of the American Home Economics Association, July 5-6, 1910.

standard should be translated into *calories* before being presented to the class, as they will have no need of knowing the standard in grams of protein, fat and carbohydrates. As the tendency of the day seems to be to give the standard only in protein and energy this still further simplifies the work. For example, Dr. Langworthy's standard² becomes, using 4.1 calories for each gram of protein, "for a man in full vigor at moderate work, food as eaten, protein sufficient to furnish 430.5 calories, and fats and carbo-hydrates sufficient to make a total of 3500 calories.'

This is one calorie from protein to eight total calories; that is, 3500 calories of food must be eaten daily and one-eighth of these should be furnished by protein.

Now, suppose we agree to make dinner contain half of the day's ration, and breakfast and luncheon each a quarter. (This special proportion need not necessarily be chosen, as any preferred arrangement may be made). Suppose lunch for a person has consisted of one glass of milk, one boiled egg, two slices of bread, butter, and one banana. Is this food in correct proportion, and is it enough? If so, according to our standard it should furnish 107.6 calories from protein and a total of 875 calories.

Using Fisher's table³ we find the following:

	CALORIES FROM PROTEIN.	TOTAL CALORIES.
Small glass milk.....	19	100
One large egg.....	32	100
Two slices bread.....	26	200
Butter.....	0.5	100
One large banana.....	54	100
Total.....	82.5	600

We have here only 600 total calories as against the 875 needed, so evidently this is not enough for the man under the given conditions. Dividing 600 by 82.5 we have the ratio of calories from protein to total calories of 1:7.3. Since 1:8 was our standard, this lunch is evidently not rightly proportioned, being high in protein.

As much adaptation of the standard to varying conditions may be made as is desired by the teacher. If the "average man" weighs 154 pounds and the average girl in the class 100 pounds the necessary

² U. S. Department Agriculture, Year Book, 1907, p. 370.

³ J. Amer. Med. Assn., 48 (1907), No. 16, pp. 1316-25.

modification of the standard is reasonably easy to find. For our lunch it would be $154:100=107.6:x$ (practically 70 calories from protein), and $154:100=875:x$ (568 calories). The calculated lunch then would have been adequate as to energy for the person weighing only 100 pounds, but too high in protein.

In order to make the work practical much weighing of 100-calorie portions must be done, but the exhibit of the amounts of food having equal fuel value catches the eye and is easy to remember. The piled-up plate of pickles contrasted with the lump and a half of sugar; the small glass of milk and the one shredded wheat biscuit; the one small chop, the slice of bread, or the one large potato, take on new meaning as to the part they play as equivalents in total calories in nutrition. But the servings mentioned in the table as "ordinary," "small," or "large" must be weighed out in detail, for people differ greatly as to the amount of an "ordinary" serving. If each member of the class cuts what she thinks is an ordinarily thick slice of bread, the slices will differ surprisingly. Dr. Fisher gives the weight of such a slice as 38 grams, the Battle Creek dietary list puts it at 28 grams, and what my class finally agreed upon as an ordinary slice of baker's bread weighed only 20 grams.

Even aside from this work, the ease of comparison of food values makes the 100-calories portion method quite worth while. For example, one day I was asked in class if it were true that dried fruits were a cheaper source of protein than meat. I turned to Fisher's table and suggested that we compare pork chops and dates.

The 100-calorie portion of dates is 1 oz., contains 2 calories from protein, and at 10 cents a pound, costs 6 mills. The 10 cents worth of dates would furnish 32 calories from protein, each of which would cost approximately 3 mills. If the chops were 28 cents a pound, and there were four in the pound, each chop, representing 4 100-calorie portions would cost 7 cents. Seventy-two of the 400 calories would be from protein, or one mill for one calorie from protein. So, although the 100-calorie portion of meat is nearly three times as expensive as the dates, as a source of protein the meat is very much the cheaper.

Shredded wheat biscuit, sometimes ranked as an expensive form of cereal food, costs about 9 mills a biscuit or a 100-calorie portion, and the protein furnishes 13 calories, or 1 calorie from protein for 0.7 mills, and is a somewhat cheaper source of protein than either the dates or the meat, although more expensive considered solely as a source of total energy than the dates.

All that is necessary to make these calculations is the market price per pound and Fisher's table.

Finally, it is very simple by the calorie method to arrange a meal that will conform with the standard, and the actual cooking and serving of such a meal with a carefully kept record of cost, trains the eye in recognizing relative food values in relation to money cost.

RELATION OF BIOLOGICAL CHEMISTRY TO HOME ECONOMICS.

WILLIAM J. GIES.¹

Biological chemistry, considered from the standpoint of its greatest usefulness, is primarily chemical biology. Its foundations are physics, chemistry and biology. Biological chemistry, as a science, is chemical knowledge of biological substances and processes, *i.e.*, substances that commonly enter, or that are produced in, or are derived from, organisms; and processes that ordinarily affect, or that occur in, or are modified by, organisms. Biological chemistry, as an art, is fundamentally chemical in method and primarily biological in purpose. The biological chemist seeks to determine the nature of biological phenomena by chemical means; he does not attempt to establish purely chemical laws through biological agencies.

Among the leading subdivisions of biological chemistry are physiological chemistry, pathological chemistry, pharmacology, agricultural chemistry, botanical chemistry, and bacteriological chemistry. Physiological chemistry is the chemical branch of physiology, *i.e.*, the chemistry of substances and processes pertaining to healthy organisms. Physiological chemistry is physical chemistry, inorganic chemistry and organic chemistry applied to physiology.

The substances that engage the attention of the physiological chemist are very numerous in kind. They range in diversity of molecular character from the very simplest inorganic salts, *e.g.*, sodium chloride, to the most complex organic compounds, *e.g.*, nucleoprotein. The processes that form a large portion of the subject-matter of physiological chemistry are not only numerous in kind and varied in character, but often are also unique; and many are wholly inexplicable on the basis of our present knowledge.

Normal organisms are specially constituted to achieve two fundamental biological results, *viz.*, their self-preservation and repro-

¹ Presented at the Boston Meeting of the American Home Economics Association, December 31, 1909.

duction. In effecting its own nutrition, an organism directly adds to its mass and enlarges its structure, as in growth; or it mainly "repairs" its parts, directly or indirectly from nutrient material, as in maturity. Nutrient materials (as a group) also supply energy, in one form or another, which is available for transformations to the advantage of the organism. Normal reproduction is, in effect, the nutrition of immature organisms derived directly from mature ones.

These two major functions of normal organisms (self-preservation and reproduction) are, in effect, the development, repair and reproduction of structure, as well as the maintenance of continuity in coördinated chemical processes. The mechanico-chemical functions of an organism (external respiration, heart-beat, excretion, etc.) are contributory to the highest efficiency of the major functions just mentioned, and, therefore, are essentially nutritional in ultimate significance. The chemical nature (composition) of an organism, as well as the peculiarities and functions of its tissues, are best understood when studied with due regard for the relations of all the parts and constituents to the nutritional processes.

Normal nutrition, whether in growth, in maturity, or in old age, is primarily chemical in method and constitutes the chief subject-matter of physiological chemistry. Pathological chemistry comprises the facts pertaining to nutrition in disease. The hygiene of nutrition is obviously a matter of fundamental personal and domestic importance.

With these ideas on the general nature and practical import of biological chemistry before us, I believe I can best perform the function allotted to me by presenting a general outline of the principal course in elementary physiological chemistry which we have been giving for about six years at the Columbia Medical School, which we have lately introduced at the N. Y. Teacher's College, and which, I feel, is particularly well adapted for the instruction of all whose interests include an understanding of the principles of general nutrition and dietetics, or any other chemical phase of biology.

In the course to which I allude, we place at the foundation of our experiments and discussions, the chemistry of typical cells as the units of living structure and the essential factors in biological dynamics. Every organism consists primarily of one or more cells. The higher organisms consist not only of cells but contain also much important material that is produced by and in their cells, but which is extracellular in location. Life is so intimately associated with intracellular

chemical transformations of energy that it seems to be dependent on, and apparently is an expression of, such intracellular changes. Many of the extracellular changes in organisms are of minor importance in the maintenance of life.

Chemical transformations of energy always involve chemical alterations of substances, *i.e.*, the production of one group of substances from another. Cells consist of mixtures of complex substances, which collectively, during the life of the cells containing them, continuously undergo life-maintaining chemical and physical alterations. Such changes involve the consumption of useful and, to some extent, of necessary intracellular substances, with an attendant production of certain simpler compounds ("waste products") that are of no use to the cells (catabolism). Accumulation of waste products in a cell interferes there mechanically and chemically with further beneficial transformations. Waste products are promptly ejected from normal cells.

Cells cannot retain their structural integrity, and are also unable to maintain their dynamic capacity, unless the life-giving intracellular processes of consumption and excretion (catabolism) are accompanied or followed by compensatory intracellular processes of repair, or direct replacement, or both (anabolism). This general conception furnishes the key to the whole subject of physiological chemistry. It carries us to the foundation of chemical biology. It emphasizes the cardinal fact that the utilization, removal and replacement of materials by an organism are expressions of its collective cellular requirements and peculiarities.

In this introductory phase of the course to which I am alluding, the composition and constituents of typical cellular masses (protoplasm) are studied; the leading cellular constituents are isolated and their structural as well as their dynamic relationships are indicated, so far as that is possible. This portion of the course is also intended to establish general principles regarding the origin and chemical nature of cellular constituents, the functions of cellular compounds, and the processes that characterize cellular activity and power. Both botanical and zoölogical materials are studied experimentally in these connections.

We then raise the question: How do animal cells obtain the materials required for their "repairs" and for the replacement of the substances consumed and removed in the life-giving transformations, *i.e.*, how are the cells nourished? The answer is found, in part, in

an intimate study of the physical and chemical properties of lymph and blood, which are the essential and active intermediaries in the exchange of materials in the animal organism (metabolism). "The circulatory system is the commissariat of the physiological army." The mechanico-chemical processes, by which cells obtain (assimilate) and blood and lymph yield nutrient materials, are considered both from theoretical and practical standpoints. The mechanical and chemical relationships between the cells and the blood, lymph, and "tissue juices" in general, are emphasized. We show that in the exercise of their local absorptive, digestive, transformative and constructive processes, the tissue cells obtain from blood and lymph the materials that are utilized directly or indirectly for the maintenance of cellular structure and the continuance of cellular activities.

Having established the direct nutritional dependence of animal cells upon constituents of the blood and lymph, we lead the student into a study of the substances and processes involved in the renewal of such constituents of blood and lymph as are utilized (assimilated) by the cells. This inquiry is, in effect: How is the supply of nutrients for the cells maintained in the blood and lymph? The chief subjects for consideration in this connection are internal and external respiration, and alimentation and absorption. The oxidative processes and gaseous exchanges involved in respiration are followed in detail. Under the general head of alimentation we study the composition, digestibility and general nutritive values of typical foods. The various digestive processes are fully treated, the influences of bacteria in the alimentary tract are considered, and the composition of feces, as well as the significance of its chief constituents, is noted. The channels of absorption are followed, and the qualities of the absorbable digestive products, as well as the transformations such products undergo, prior to and after their incorporation into the blood, are given due emphasis.

In the study of alimentation and absorption it is shown, for example, that food, which ordinarily consists for the most part of heterogeneous masses containing many complex substances, is chemically converted into fairly homogeneous liquid mixtures containing comparatively few, and relatively simple, nutrient products. The student learns that chief among the digestive products are monosaccharids, mainly glucose (representing primarily the food starches), glycerin and fatty acids or corresponding soaps (representing chiefly the food fats), and amino-acids (representing the food proteins). The student is also

taught, as clearly as possible in this connection, that the digestive and absorptive processes are analogous, in their results, to the achievements of stone cutters and masons. Stone cutters convert rock masses of various shapes and dimensions into massive construction units, of a few types and sizes, which masons put into harmonious relationships in the erection, repair, or extension of buildings on definite plans. The digestive processes convert organic food substances, of many different types and molecular configurations, into molecular construction units of a few kinds and sizes, which, in most cases, are specially adapted for immediate conversion into compounds characteristic of normal blood and lymph. Various groups of cells along the absorptive channels actively rearrange many of these organic molecular construction units into normal blood and lymph constituents of the more complex types.

The opposite phase of cellular nutrition is next brought forward. How are waste products eliminated from the cells? What are the local and systemic influences and general fate of the various kinds of waste products? The gaseous eliminations having been considered in the prior study of respiration, and the gastro-intestinal excretions having been discussed in connection with the previous observations on feces, further attention (though for the time being only in a general way), is now given to local and general excretion, especially from the skin and kidneys.

This sequence in the consideration of subjects enables us to proceed easily and logically from a study of the typical individual cell, of cells in general, and of the body as a whole, to examinations of specific parts of the organism, *i.e.*, of the groups of specialized cells, the respective tissues and organs. Such examinations develop the essential facts regarding tissue structure and composition, as well as the local and general functional relationships of the peculiar tissue constituents. The relative chemical activities and the corresponding nutritive demands of the tissues as specialized parts are duly emphasized, and the way is prepared for final and more detailed considerations of general metabolism, the nature and metabolic significance of the various urinary constituents, and food requirements and selection.

The laboratory work of this course (6 hours per week for a half year) is extended into every important phase of the general subject. The formal lectures (two weekly), besides correlating the results of the experiments and demonstrations with the essential principles, are devoted to various general themes that cannot be given objective

treatment in the time allotted for the course, such as chemical coördinations in the body, the chemical processes in embryonic development and lactation, chemical defenses of the organism against disease, biochemical effects of medicines and other foreign agents, typical biochemical perversions associated with disease, etc. The course is designed to establish fundamental biochemical principles, and to develop capacity and confidence in the interpretation of biochemical phenomena.

The prerequisites of such a course as I have just outlined are physics, general chemistry, organic chemistry, and physiology or general biology. It is impossible to understand the scientific and practical aspects of general nutrition and dietetics without the knowledge afforded by such a course in physiological chemistry.

If my remarks have led you to the conclusion that, in the course I have outlined, every problem is viewed from its relation to the central fact that the cells are the units of structure and the centers or agents of biological power and activity, one of my main expectations has been realized. It is customary in many quarters, in the study and exposition of the data of normal metabolism, to deal largely in nutritional and dietetic generalities—to consider the body as a whole, but to disregard the chemical peculiarities of its parts and to ignore the eccentricities of local (tissue) chemical behavior. Nutrition and dietetics should be studied and taught, in connection with related subjects pertaining to Home Economics, for the purpose of establishing healthy dietary customs, and thereby preventing malnutrition and consequent disease; and also in order to provide information leading to the relief, and if possible to the cure, of metabolic disorders by adequate nutritional readjustments. Such study and instruction should be based on the fullest knowledge of the peculiarities of cell chemistry in general and of tissue chemistry in particular, both in health and disease.

I am sure you will agree with me when I say that investigations of the kinds and quantities of food supplies shipped into Boston, and inquiries regarding the general selection and preparation of such materials, the main channels of their distribution and the methods of their transportation to the various parts of the city, together with determinations of the nature and peculiarities of Boston's sewage and sewage system, would fail to afford correct or adequate conceptions of Boston's dietary characteristics or requirements. We should have to learn much, besides, about the people of Boston in order to

understand and appreciate their collective dietary needs. We might ascertain many general facts pertaining to the city and its inhabitants, in times of peace as well as in periods of disorder, and yet, if we learned little or nothing about the people of Boston as individuals, if we ignored their individual characteristics and activities and needs, as well as the occupations, customs and other peculiarities of the various groups of citizens, our deductions regarding the kinds and amount of food needed daily in Boston would be decidedly imperfect, and our conclusions on ways and means for maintaining the nutritional welfare of all the people in Boston would be largely guesswork.

So it may be with certain courses in nutrition and dietetics. Our study and teaching of these important matters should not be confined to the accumulation and interpretation of general statistics, but should include due attention to the dynamic factors in metabolism—the individual cells and the tissues, under both normal and pathological conditions.

Such an elementary course as the one I have outlined, if based on adequate preliminary training in physics, chemistry and biology, offers much to be desired in this connection. I am glad to add, in conclusion, that my experience at Columbia with courses of this kind has given cumulative emphasis to these opinions and convictions.

DISCUSSION

MISS KINNE: I should like to ask Dr. Gies where he would place his course in such a scheme as Dr. Stiles has presented.¹

DR. GIES: It seems to me that, in Dr. Stiles' arrangement of courses—which is a very good one—physiological chemistry should occupy a place beside anatomy and mechanical physiology, or should follow anatomy and mechanical physiology. Naturally all arrangements of courses are matters of practical adjustment, and it is a rare thing that any one course can be fitted ideally into a system of courses. I feel that the leading chemical applications to physiology should be emphasized in connection with studies of anatomy and mechanical physiology. My statement that physiological chemistry is chemistry applied to physiology might be put in another way—that physiological chemistry is chiefly *chemical physiology*. I think that, along with anatomy and physiology, chemico-physiological facts

¹ J. Home Econ. 2 (1910), No. 2, p. 393.

and principles should be given due consideration—and in a separate laboratory course whenever that can be done.

MISS MARLATT: I am concerned with the question as to how much of this biological chemistry can be given to students who have not had work in organic chemistry. I should like to ask Dr. Gies' opinion on that matter.

DR. GIES: Such a condition offers a very serious predicament. It certainly is true that you cannot satisfactorily teach biological chemistry to students who do not have adequate knowledge of elementary organic chemistry to begin with. If you endeavor to teach the elements of organic chemistry and the applications of chemistry to biology in the same course, you find it impossible to do justice to the latter subject, and you confuse and disappoint the average student besides. I hope the deliberations of this association will bring about increased requirements and greater opportunities in physics, chemistry and biology at the beginning of the training of women in higher education. You need these three tools in your biological work in household arts and sciences; and they should be as effective in your hands as we try to make them for the students and practitioners of medicine.

COURSES IN BACTERIOLOGY FOR HOME ECONOMICS.

H. W. CONN.

Professor of Biology, Wesleyan University.

Botanically speaking, bacteria form only a small family of minute plants. In most botanical text books they have until recently not been described at all, and even to-day only a page or two is given to them. But though botanically they are of little importance, practically they have been found to have a most profound influence upon the life and welfare of the home, and consciously or unconsciously every housewife has to deal with them. From morning till night she is constantly contending with them or using them as allies. The importance of the functions performed by these organisms has already forced their study into our medical schools and they are rapidly demanding more and more attention from the students of agriculture. No less closely are they related to Home Economics, and no less surely is bacteriology forcing itself into courses of domestic science.

In considering the ground that should be covered by such a course it is a logical necessity to include with *bacteria* the study of the closely allied *yeasts* and the less closely allied *molds*. For while in popular estimation yeasts and molds have a very different kind of reputation from bacteria, in reality they are so very similar, in function at least, that it is quite impossible to separate them. Not only are they microscopically much alike, but they are all studied by similar methods and are all associated with similar functions. The study of bacteria in Home Economics must therefore inevitably include the yeasts and molds. The general term *microbiology* would be a much better title to this class of studies than the more widely used term *bacteriology*.

The course covering this subject in Home Economics should include two different phases which, however, ought to be combined into one consistent whole. The first should be a theoretical course with a text book, accompanied by lectures and illustrations. Unlike many branches of science bacteriology cannot well be taught by the laboratory method, especially with large classes. Microscopes are too expensive, laboratory equipment too rarely at hand, and experimental

work is too time-consuming to make it possible to cover much ground in the laboratory. For general information, therefore, reliance must be placed upon class-room work with lectures and demonstrations.

But the fundamental facts of the nature, distribution and multiplication of microorganisms can only be appreciated by the use of the laboratory method, and the second part of the course should include some practical laboratory work. This should accompany the theoretical work, though it cannot follow in parallel lines owing to the length of time required for making culture media and in waiting for cultures to grow. For simple laboratory work no great amount of apparatus is needed. A microscope to show the actual appearance of bacteria is desirable but not absolutely necessary, since most of the experiments will handle bacteria in masses and not individually. The equipment of a school kitchen, with some glassware borrowed from a chemical laboratory and a few Petri dishes and fermentation tubes will serve as apparatus sufficient for an extended series of useful experiments.

THEORETICAL COURSE.

The practical value of bacteriology to domestic science is indicated by the simple enumeration of the topics which it should include.

Non-pathogenic microorganisms:

Useful—Microorganisms are not used in the home for a very great variety of purposes. This subject covers, however, the function of yeast in fermentation, including the raising of bread and the preparation of fermented beverages. Molds are only incidentally useful, though they are the cause of some of the delicious cheese flavors (Roquefort, Stilton, Camembert). Bacteria are of little value in the home, but they are at least the cause of the souring of milk and they are the agents which produce vinegar, sour kraut and some other soured foods.

Detrimental—The undesired activities of bacteria are endless, but they are all associated with their agency in producing decomposition. Like all colorless plants they are concerned in the chemical destruction of organic foods. *Yeasts* cause the breaking down of sugar and spoil our sugar-holding foods like jellies, sweetened condensed milk, maple sugar, etc. *Molds* attack various substances which are damp but not wet and cause the decay of fruit, the mustiness of cheese or flour, the mildew of cloth or leather, and sometimes the decay of wood. *Bacteria* are not fond of sugars but will attack

almost any kind of wet food. They cause putrefaction and decay. They sour or otherwise spoil milk and render it impossible to keep it long; and indeed they prevent the keeping of any kind of moist food. They are the cause of most of the bad odors around the pantry and the ice chest and they are actively at work in the garbage pail and in all masses of kitchen refuse. In sink drains, in closets and traps, and even in foods which are stored for a few hours only, they are busily at work. That all these phenomena, together with methods of preventing them, should form a part of the study of Home Economics is too evident to require emphasis.

Pathogenic Organisms:

The relation of microorganisms to disease is to-day everywhere recognized; their relation to contagion is less fully understood. The treatment of disease belongs to the physician, but the checking of contagion is primarily a part of Home Economics. It is to-day appreciated that the nurse plays a part in the handling of disease not second to the physician, but it is not sufficiently realized that the confining of diseases to the sick room and the protection of the rest of the family belong emphatically to the home-keeper. Clearly no one is fitted to be the head of a properly kept household in these days who does not understand the relation of contagion to living germs, the general nature and conditions of life of bacteria, their method of discharge from a patient, their means of distribution from the sick to the well, their channels of entrance into the individual, and the methods of destroying them or preventing their distribution. The meaning of bacteriological cleanliness, the cleansing of wounds and methods of disinfection and sterilization should be a part of every housewife's educational equipment. The amount of sickness, suffering and death that is directly attributable to a lack of such information is simply incalculable, and knowledge of bacteria and their habits has thus become one of the integral requirements for properly conducting the home.

PRACTICAL COURSE.

The kind and number of laboratory experiments and class demonstrations that accompany the theoretical work must vary with the conditions of the laboratory and the time available for such work. Even without a microscope much can be shown by cultures and

handling bacteria in masses that will greatly illumine the class work. Suggestions for many simple experiments and class demonstrations may be found in books easily obtainable. They should include the preparation of simple culture media and easy experiments in making bacteria cultures. Culture plates exposed to the air of a room before and after occupancy by a class, or before and after sweeping, teach a lesson concerning the distribution of bacteria and molds more forcibly than any class work can do. Tests as to the keeping of milk at cool and warm temperatures, with and without sterilization or pasteurization, are easily planned and carried out, and materially add to and emphasise the study of milk bacteria. Tests upon the efficiency of drying as a method of preventing bacteria or mold growth and upon the value of disinfectants are easy to devise. The bad influence of a piece of decaying fruit when in contact with whole fruit is easily shown and the functions of yeast in bread-making with the relations of these phenomena to temperature may be readily demonstrated by fermentation tubes. A student who has actually seen growing upon culture plates colonies from bacteria which have dropped into it from the air will retain a vivid and lasting lesson that no text book can impart. The greater the number of such ocular demonstrations the more thoroughly will the subject become a part of the equipment of the student until she will learn unconsciously to adopt right methods.

The time required to cover such a course will inevitably be in a measure determined by that demanded by other subjects. It should not cover less than a term's work and could be profitably extended to double this amount. There will always be a temptation to neglect such work in favor of the more attractive phases of Home Economics, and for this very reason more emphasis should be placed upon the subject.

THE IMPROVEMENT OF PUBLIC HEALTH THROUGH THE TEACHING OF HYGIENE IN THE ELEMENTARY SCHOOLS.¹

FRANCES STERN.

The scientific laboratory has been studying conditions and causes of disease, and new ways and means must be devised to apply this knowledge for the creation of right living conditions. Perhaps all that can be done for the adult is to give him the means of knowledge—point the way how to use it, and let him accept it if he will—but for the children, parents and citizens of the future, there is a deeper responsibility. The state has taken it upon herself to educate these children.

It certainly seems reasonable that as much attention should be given to the building up of a healthy body as to the development of the mind. During the early years of school life the growth of the child should be given the foremost consideration.

The body has withstood the ravages of civilization so wonderfully that not until aroused by the leaders in the campaign against tuberculosis or those investigating the health of the school children have we realized the number who are suffering from physical ills, due to lack of wholesome food, fresh air, or proper clothing, and shelter.

Attempts to teach the simple principles of hygiene have been difficult, owing to lack of provision for such teaching in the public school. The school house and school room should themselves be examples of cleanness and afford every means to help the child to live under the conditions that make for right living. As has been said, "a most essential part of modern education is the early formation of such habits with regard to environment as shall conduce to the best living," but it seems almost useless to teach the lessons of hygiene and sanitation when the child has but to look about and see the laws violated, or to ask him to clean his hands if he is denied hot

¹ Read at the Boston Meeting of the Education Section of the American Home Economics Association, July 5, 1910.

water. At least the school-room dust can be cared for with a dustless duster, if a vacuum cleaner is out of the question. After a scientific lesson with Petri plates, the children will be interested to keep the room free from dust as far as possible.

Treating the subject of hygiene through such interest, it can readily be made an integral factor in the following group of topics: The care of the home, the furnishing of the home, food and its care and preparation, personal hygiene, and the hygiene of clothing. The essentials common to the above topics that make for the health and well-being of the child, are cleanness, pure air and sunlight, exercise and rest, and the beauty of environment.

The child has little direct influence on these, for the adult chooses the home, limited in choice, perhaps, by a meagre income and the type of building found in the large cities. But in the early period of life the child does not apprehend his environment. His imagination, stimulated and fostered in play, seems to create experiences that are as delightful as they are real. The doll of wood is hugged as closely as the most expensively dressed French doll, the gold house set with diamonds to be won in "London Bridge" is in imagination not far away. Subways may be dug in sand, and temples erected with sticks and stones. Cannot educators striving to improve the health of the child make use of this play, and translate it into a directive force for the child's good through this means?

The scheme must be clear in the teacher's mind—she must study the child, and adapt the work to the child's growing need. And, further, she must be so familiar with the scientific facts that their application is, like art, concealed. In the building of a house, for example, the first lesson in ventilation is that there must be an outlet for the foul air at the top of the room. This thought can be developed beginning with the child in the kindergarten, in the construction of the house of blocks or the paper cutting; it can be shown in the representation of a room, pictured on paper, the fitting and furnishings cut from magazines and catalogues; it can be written about in the hygiene lessons, illustrated by cuttings and drawings; it can be considered in the plan for the wooden or card-board house. If the lesson is kept alive in the child's mind, and emphasized at the different stages of development, and through different forms of work, when he has the chance to control the windows in his own home they will be kept open.

The children at the Louisa Alcott Club had been constructing a

paste-board house made from a hat-box. The principle of ventilation had been discussed, and the writer wished to illustrate it by means of the little house, but since it was so likely to take fire, a wooden box, representing a section of a room, was used. This box measured 12 by 12 by 6 inches and had six holes, two on each side, one a little below the top and one near the bottom, and two at the top one inch and a half in diameter, closed with corks to be taken out at will.

First the children breathed into tubes containing lime water (colored red with phenolphthalein) and the liquid turned white. Then the carbon dioxid from a burning candle was collected in a tube, and produced a similar coloration of the solution. To show more clearly that this was the result of combustion, sugar was burned and the carbon dioxid collected and subjected to the same test. The children could easily see that the gases were alike in this one respect. The pretty red solution and the magic change to white pleased them.

Candles were then placed on a diagonal in the box and lighted, with the result that the carbon dioxid rising with the heated air caused the upper candles to go out. Some of this air was drawn through the same red liquid, and thereby the children learned that the candles were giving off the same material as had been secured in the tubes, and that this affected the candles at the top of the room. The children tested the air currents by means of joss-sticks, to see which way the wind blew. The upper holes, those in the roof, were then opened. Immediately all the candles brightened, and the children saw that fresh air was entering as the warm air and carbon dioxid passed off.

Various other experiments were tried, such as supplying air from above, below and with cross currents; sometimes breathing into it and then drawing out the air, and testing with the lime water; or again, drawing out the air in which the candles had been burning. It was unanimously decided always to have the windows open from the top, and to try not to sleep in a room where candles or lamps were burning.

Such a lesson need not take much extra time, for it may be made a lesson in hygiene, drawing, and arithmetic, extending over several periods, and along with this, the written work will be most effective. The lesson in English, so necessary to the children, can be taught through the subjects close to their lives, and since it tells of the great wonders of the universe, it can be made uplifting. Compositions about household activities can be illustrated by cuttings

from magazines and catalogues, and even so ugly a subject as garbage has been made interesting. The bedroom, with its pretty furnishings, and the early morning light awakening the inmates, has made a very charming story.

This winter the story about tuberculosis was written, without any phthisisophobia, because it was based upon the laws of nature and sanitation. Through a talk about the plants and flowers, tracing cause and effect, they saw that all life comes under the same laws and that the laws of sanitation or hygiene could prevent as well as cure. The scientific presentation made it impersonal, though its application was concrete.

The public school curriculum is still so crowded in the desire to develop the child in every direction that it cannot lay sufficient stress on education for health, and the majority of homes cannot, or do not, provide these elements of instruction which every child should receive. The result is that a large proportion of the children in the schools are physically unfit. For these children a new type of school is essential. The open-air school meets this need, by giving careful attention to every detail of nutrition and sanitation. The child lives in the open air and is taught to know its value, so that in time his system rebels at close quarters. He has simple, good, wholesome food, and gradually desires it above all other. He learns to delight in a cold sponge bath that invigorates, and in warm water and soap that clean the hands and body.

The daily routine in the school begins to affect his life so that these lessons are carried into the home. Sometimes the conditions are difficult to overcome, and sometimes the family at home does not quite understand, and so, as extension work, a "visitor-teacher" should be sent to help the home fulfill the instruction given at school.

This survey emphasizes two important points: First, that in education health is fundamental and that the school should train the child in habits of health; and, second, that to accomplish this end, conditions in the school room must be wholesome. The child should be given a comfortable chair and desk suited to his size. The school room should be well lighted, the air in the room fresh and free from germ-bearing dust. There should be time for play out of doors, and time and facilities for bathing.

It is possible for the teacher to correlate the studies and to give instruction in practical hygiene, inculcating habits of cleanness and an enthusiasm for health which will give her pupils the chance in after life to be healthy, happy, efficient beings.

TEACHING BACTERIOLOGY TO MOTHERS.

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The Problem.—Until such time as poverty is abolished, or the State takes charge of children, the majority of the women of the race must continue to rear the majority of the children of the race inadequately, in homes too small, without facilities, doing for them somehow, individually and alone, that which three women could hardly do well, working together.

This is not a slum problem nor a problem of the rich. Numerically the race is chiefly middle class, neither rich nor extremely poor, judged by ordinary standards. This is the problem of the family with an income below \$3000, *i.e.*, it is the problem of the race proper, and it is the old problem of the pre-mosaic Hebrew—how to make bricks without straw,—alas, without knowing how to make bricks at all.

The problem as a whole involves food, clothing, proper physical development, morals, education, amusement, discipline, and citizenship. But the public hygienist has *as yet* but indirect concern with these. The public hygienist—the “board of health man”—*as yet* concerns himself chiefly and by general expectation and consent, with the grosser, more imminent, more spectacular, more immediately tragic problems of disease and death, and chiefly with only one group of these, the infectious diseases. However much in ordinary life, over-crowding, lack of facilities and over-burdening of the mother may render unavailing even the tears and ageing, the back-ache, heart-ache, crooked fingers and wrinkled face of the mother striving for her young, ten times over is the effect of these seen when disease enters the family, adding its burdens, its sorrows, its disabilities and its deaths.

Once more, remember this is not in the slums alone, nor, numerically, chiefly there. It is found in city and country, village and town, everywhere, the overburdening of mothers, in ordinary life, added to ten times over when disease springs up.

How Big A Problem is It?—Call the population of the United States 80,000,000. Remember that sooner or later, every member of each generation suffers from at least one infectious disease, often from two, three or four, and it is clear that every generation suffers anywhere from 80,000,000 to 240,000,000 attacks of infections. Each generation pays out at least eight billions of dollars for this running of the gauntlet, not to speak of the disability and death of those who run it unsuccessfully. Tuberculosis, diphtheria, summer diarrhea, scarlet fever, measles, typhoid fever, whooping cough, chickenpox, to name only some of those best known to the laity, how much sorrow, distress, poverty, how much “making of none avail” of mothers’ hopes and prayers and wearing effort have these caused! Yet so common are they that “childrens’ diseases” are looked upon as a necessary stage, almost a joke. Indeed some people deliberately expose their children to them, “to have it over with!” Yet who bears the burden, the sleepless nights, the extra work, the nervous strain, the hope deferred?

Ninety-five per cent of the infectious diseases are nursed at home by mothers. Next to the children themselves the one who suffers most is the mother.

Who Keeps the Infectious Disease Going?—Once more the answer is—and most emphatically—the mother, woman in general, but chiefly after all the mother. To be sure there is every excuse for the mother,—overwork, overcrowding, lack of facilities, above all ignorance and misdirected training, “mis-information piled on lack of any,” but with all the perfectly good apologies stated and all the excellent goodwill and effort counted in, the fact itself remains, that mothers propagate and keep alive and spread the infectious diseases of children more than any other one body of people, and that until they learn the rules of the game and follow them, no amount of coaching or effort from the sidelines will help.

Why and How are Women Responsible?—Because mothers are doing the work—women in general, but chiefly mothers. The farmer is responsible (apart from flood, drought, storm or other “acts of God”) for whatever happens to the crop from seed to market. Women in general—but chiefly mothers—are the “raisers” and “crop-handlers” of the largest, most valuable, most expensive and most difficult crop in the country. What happens to this crop between birth and sixteen years of age is, chiefly, what women do to it, or at least do not prevent. For the first 5000 days of the years of the life of

each generation, the race is fed, dressed, undressed, washed, combed, cuddled, kissed, praised, blamed, led, driven, coaxed, taught, spanked, bossed and otherwise "brought up" by women—women mothers at home, women teachers at school. It is during this time of tutelage and supervision by women that children receive their infections; it is during this time that the race runs its gauntlet, dances its little dance with death—and pays eight billions for it.

What is the Specific Fault of Mothers?—Let it be understood that the specific fault is of the head, not the heart. It is due to bad teaching and misdirected energy. It is almost impossible to avoid it under existing circumstances, and it is extremely disgusting to talk about. However, as to the last point it may be said as Dr. McCormick has it—it is much more disgusting to do.

The specific thing at fault in the spread of infectious diseases is the exchange of discharges. We know now that practically speaking all the infectious diseases are infectious because they are caused by bacteria or similarly minute forms of living things. It is the transfer of these germs from sick to well persons which spreads the disease. The sick child, whether it has tuberculosis, typhoid, diphtheria, scarlet fever, mumps, measles, or whooping cough, has its discharges full of germs of the disease concerned. In typhoid fever, the germs are chiefly in the discharges from the bowels and bladder, in the other diseases chiefly in the discharges from the mouth or nose. But however these germs leave the sick person, they, practically speaking, never produce another case of the disease unless a well person gets these discharges into his or her mouth. Disgusting? Yes,—but *true*. If a child never takes the discharges of a sick person into his mouth he will never contract an infectious disease.

As a matter of fact the exchange of normal discharges goes on all of the time. Think of it. The mother kisses her baby, or tries the nipple of the nursing bottle to see if it draws well, or if the milk is warm enough, by first sucking the nipple herself, and of course her mouth discharges go into the baby's mouth. She feeds the baby with a spoon, and tries the temperature of the spoon and its contents in her own mouth first or she laughs and talks into the baby's face, cuddling and playing with it. The fine spray from her mouth, thrown out in the explosive outrush of air during speech, as it is not during quiet breathing, flies over the baby's face, into its mouth, eyes, nose, and the baby's into hers. But so long as the discharges of each are normal no great harm results. But, if either

mother or child have tuberculosis or diphtheria, etc., both are pretty sure to become infected.

So, more remotely, there are possibilities of infection from the mother as she talks or sings as she lays the table or prepares the food, thus spraying her mouth contents into and upon everything in front of her—and her children put these things into their mouths. Still this is, although the most inevitable, the least of the ways of transmission of infections.

The chief spread of infections is on the hands—tuberculosis, diphtheria, scarlet fever, the whole list. It is human nature to put the fingers into the mouth. It is mother nature to put her fingers into her children's mouths, directly or indirectly through spoons, cups or food itself.

But the discharges of the mouth and nose are not alone those transmitted. Through hurried or inefficient washing of hands the mother even transfers bladder and bowel discharges from herself to her children's mouths, directly on her hands, and indirectly through food and eating utensils touched by her hands. She transfers the children's discharges from one child to the other also. The children do the same. They convey their own discharges on their hands, and indirectly by touching things such as food, gum, pencils, and whistles, that go into other children's mouths.

It is the serious belief and teaching of the best professional public hygienists that in these two ways—mouth-spray for mouth discharges, and hands for mouth, bladder and bowel discharges—the ordinary infectious diseases are chiefly transmitted. With rigid attention to these points trained nurses in certain Parisian hospitals successfully nurse in open wards diphtheria, scarlet fever, and measles together without any patient contracting another's disease. Very much more might be said to emphasize, illustrate and demonstrate the truth of these statements, but perhaps the fact that this is the basic principle of modern epidemiology will be sufficient proof.

Teaching Bacteriology to Mothers a Partial Solution.—From what has been said it must be clear that the ordinary interchange within the family of the discharges of the members of the family, and at school of the attendants at the school, is constant and inevitable while things remain as they are. Where is it possible to break into the conditions and so change them that this exchange shall cease?

We take desperate measures to prevent this exchange of discharges in the face of epidemics—isolation of the patient, quarantine of the

family, removal of the patient bodily to a hospital. These measures, especially the latter, keep the stream of discharges from the sick child away from the mouths of those outside the family, but only removal to a hospital will as a rule be effective in preventing continued or even more concentrated exchange within the family—for isolation within the family in the ordinary overcrowded house, with the ordinary overworked mother, knowing nothing of these things practically, rarely succeeds. The real difficulty lies deeper still in present conditions. It may be possible to prevent the discharges of the sick child, recognized as having a contagious disease, from entering other people's mouths. But the existence of the constant exchange of discharges in the family and at the school makes it almost inevitable that in the early stages of the disease and in many cases of disease too light to catch the attention of the mothers, the harm is done before, if ever, the case is recognized. Undoubtedly the early, unrecognized and alas! the concealed cases (concealed by the mother, it may be, to avoid quarantine or isolation), maintain the infectious diseases much more than the plainly recognized case. Hence, the only perfect safeguard is to do away with the exchange of normal discharges in health, as a matter of habit and principle, in order that when disease comes the pathways for its spread may not be beaten smooth, ready and waiting to carry it broadcast before its presence is recognized.

Women unfortunately are innately clean as regards visible dirt—probably as part of the feminine desire for adornment. But it is not visible dirt that hurts, it is invisible dirt. The clean shining morning face is not half so important as clean—really clean—hands, hands free of discharges. If the floor be free of discharges, those horrors of the housewife, dust and mud, do no real harm, or so little as to be practically negligible. The white collar and cuffs, the brushed hair, the fresh table linen and the polished spoons and forks mean nothing from a sanitary standpoint, and if meanwhile the cook is putting discharges into the food, these refinements are worse than mere delusions, they are snares.

To teach women—girls—prospective mother,—that they may practice in their households and teach in turn their children to war on invisible dirt is one of the functions of bacteriology. Bacteriology alone will point the way to real cleanliness. Only the starting demonstrations of its unescapable conclusions, ground into the people can secure results. Only in the public schools can it be taught with emphasis, weight and uniformity enough to impress the masses. Only

in the grades can it be counted upon to reach the masses. But 1 per cent. of the population ever reach the university, but 25 per cent. reach the high schools. The great mass of the mothers of the coming generation—of the American race—and the mothers of more than their average of children are receiving grade school education only. Need more be said?

Summary.—The infectious diseases in general radiate from and are kept going by women. Women must learn to break up, divert, stop in some manner—in every manner—the exchange of normal discharges amongst children at school and amidst families at home if infectious diseases are to be abolished or abated. The needful information, beliefs, technique and habits cannot be had or established except by studying the basic principles of bacteriology. Bacteriology must be taught in the grades of the public schools if it is to reach those who most need it.

Radical changes in Social Conditions the Real Solution. If (as cannot be) every girl now at grade school could be thoroughly taught all that a trained nurse knows—theory and practice—the best to be hoped is that, becoming a mother, ten to twenty years hence, she may remember enough to care for, if she have the facilities, the first case of infection in her household without permitting its spread to the other members or to outsiders. Alas, not one third of the girls would remember, not one-tenth will have the facilities. Above all what shall be done in that intervening ten to twenty years? Lectures, writings, sermons, appeals to mothers' clubs, university extensions, moving pictures—all the publicity that can be had or hoped for—will not teach technique to the mother now in possession of the present generation—although they all help—nor once more, if it taught them, would it provide the facilities needed. Economic conditions must change and change specifically to aid the mother if we are to gain at all. Also, the prevention of disease must engage the serious attention of governments—the *prevention* of disease, not the talking about it or the looking wise over it, or the making of fine addresses on it, but *preventing* it. The prevention must include a tremendous organization to prevent human discharges entering water supplies, milk supplies, food supplies; must involve watchfulness of hotels, restaurants, public institutions of all sorts—in short, of all public alimentary utilities, with all their off-shoots and side issues wherever found. And the whole must be coöperative. The government must strike at the sources, the woman at the means of spread, and the man must support both, for the sake of the women and children.

DOMESTIC SCIENCE IN HAWAII.

AGNES HUNT.

The various educational institutions in the Hawaiian Islands have a peculiar situation to meet owing to the diversity of nationalities and consequent diversity of languages. Among these nationalities, the Orientals, including Japanese, Chinese and Korean, take precedence as to numbers; the Hawaiians, Portuguese and Porto Ricans next, and the English, Americans, and Germans following. Just recently a large number of Russians and Filipinos have been brought to work on the various plantations. Owing to this conglomerate group of peoples, "pidgin English," the vernacular common and peculiar to the east, has come into use, influencing to a very great extent the purity of the English language.

The Chinese and Japanese maintain schools in which their own languages are taught and their traditions preserved. Many of these children attend the public schools regularly from nine in the morning until two in the afternoon five days a week, while they attend their own schools early in the morning from seven until nearly nine, then in the afternoon for two or three hours, Saturdays and Sundays only adding more time for the study of their native languages and learning.

The different educational institutions here may be conveniently divided according as they derive the funds for their support as follows:

(1) *Those supported by the territory and the federal government.*—Under this group come the public schools, the normal school, and the College of Hawaii. The public schools are quite thorough and complete in their work. The teachers and supervisors are well trained men and women, the majority having received their education on the mainland. The high school work is of such grade that its graduates are received in most of the universities of the United States without any further preparation. It is to be noted, however, that the average age of pupils in the grades and high schools is relatively higher than in corresponding grades in the States. The normal school has an efficient force of teachers, many of them of college training, who graduate from the various departments teachers filling good positions on

the islands. Manual training and domestic science come in for their share of attention. The College of Hawaii is a new institution, of university rank, having its origin under the Morrill acts of 1862 and 1890, thereby corresponding to the land-grant or agricultural and mechanic arts colleges of the various states and territories. The first year of instruction commenced in 1908 with four courses, on completion of which degrees are granted in agriculture, engineering, science and Household Economics. Only those who have been graduated from a high school of acknowledged standing or its equivalent are admitted as regular students.

(2) *Privately endowed institutions.*—Among these are the Kamehameha schools, the Punahou School, better known as Oahu College, the free kindergartens, Kohala Seminary for girls, and the Hilo Boys' Boarding School, all on Hawaii, and the Maunaolu Girls' Seminary on Maui. The Kamehameha schools comprise two separate schools, one for boys and one for girls. Only pupils of Hawaiian parentage are eligible for entrance. Through the large endowment from the Bishop estate, the equipment is first class, the dormitories and campus spacious and well-kept and the faculty of a high grade. The institution especially emphasizes manual training and domestic science.

The Punahou School is an outgrowth of instruction given in the earlier days for the children of missionary families. The work given includes the grade work in the preparatory department and the high school work in Oahu College, fitting the graduate to enter the College of Hawaii or other collegiate institutions without examination. The instruction is unusually good, and the buildings and campus are imposing, while the athletic field adds no little to the attractiveness of the institution.

The free kindergartens are doing an effective service, nearly a thousand children taking advantage of them to gain some knowledge of English before entering the receiving and primary grades. Kohala Seminary, Maunaolu Seminary, and the Hilo Boys' Boarding School give instruction of lower standard than the high school work, but no less effective.

(3) *Institutions in part or entirely supported by religious organizations.*—These include the Mid-Pacific Institute (partly endowed), Iolani College, Aliioli College, St. Louis College and several mission schools in various parts of the islands. The Mid-Pacific Institute comprises the Mills Institute for boys and the Kawaiahao Seminary for girls. Its scope is similar to the Kamehameha schools, except

that it is not restricted by creed or nationality. The term college as quite commonly applied in the islands is somewhat misleading, as can be seen in the cases just mentioned where the instruction hardly extends beyond the seventh or eighth grades.

The Palama Settlement, the St. Elizabeth's Mission in Honolulu, and the various missions over the islands indicate to a very limited extent the phenomenal philanthropic spirit manifested by generous people.

Thus it can be seen there is not a dearth of education facilities, but rather a scattering of forces that have evolved to the present status through changes in the government, the missionary activities, and interests aroused through philanthropic stimulus.

The idea of domestic science in the Hawaiian Islands is not new. Some of the institutions have applied domestic science as a system whereby the running expenses of the institution are reduced to a minimum. That is, the work is apportioned out to the girls, and under the supervision of trained assistants all the work from the laundry to preparing the meals and caring for the household is done by them. This system is carried out in the Kamehameha Girls' School, the Kawaiahao Seminary, the Kohala Seminary, and the Girls' Industrial School (reform school). Each girl thus learns how to perform all the duties of a household and to do them systematically. The advantage of this is plainly evident when one considers that only a few generations have passed since the homes of the native Hawaiians were grass huts, their china, wooden bowls, their food, fish from a nearby pond and "pot" from an adjacent taro patch.

It is very difficult to teach much more than the actual methods in these institutions, with a little of the "whys and wherefores." With sewing, the girls are much more apt than in the other work and seem to have a natural gift for it. Whether the love of personal adornment appeals more to them and they can see the immediate improvement more readily than in the other branches, I cannot say. They are very soon able to make for themselves simple gowns neatly and prettily. The courses in the schools just mentioned are systematic, starting in with the lower grades and working through until the drafting, cutting and fitting are very deftly done. Mrs. Agnes Burt of the Kawaiahao Seminary has just published two clever manuals in which the work done during the terms may be preserved intact for each girl. The first manual has printed instructions for the various stitches with methods, and opposite each a blank leaf for the sampler to be inserted.

The second manual has a similar arrangement for advanced combinations of stitches and drafting. A view of the main sewing room of this seminary is shown in the frontispiece of this number.

The department of domestic science of the normal school, under the supervision of Miss Lee, formerly of Teachers College, gives instruction in both cooking and sewing. Quite a novel scheme has been developed in order to maintain domestic science work in this school. The funds available have from the first been very limited and the work has been so arranged that the foods from the kitchen are sold for a very nominal fee to the pupils and teachers as a luncheon. This usually consists of a soup and a dessert, sandwiches and a dessert, or a soup and a salad. Quite a variety of dishes may be learned, but the pupil has little or no time to find out anything aside from the mere duties that are assigned to her.

The department of Household Economics in the College of Hawaii is fairly well equipped, considering the cramped quarters it at present occupies. The kitchen will accommodate eight students and is fitted with gas and electricity. Each girl has her own utensils in a conveniently arranged drawer and an individual gas burner over her desk. A practice dining room serves at present the double purpose of sewing room and lecture room. The various courses offered are personal hygiene and sanitation, textiles, selection and preparation of foods, house construction, sanitation and decoration. As the department develops it is hoped to extend the courses to include household management, chemistry of food, dietetics and other branches as needed. Besides the above, the student in the department is required to take work in English, German or French, art and design, chemistry, botany, history, physiology, zoölogy, economics and such others as she may elect. The enrollment at present is small and consists of special students, but interest in the work is manifested and there are reasons to hope that very shortly the department will have more than it can accommodate in the present temporary quarters. A correspondence course in the nature of extension work has been started, giving an opportunity to those on the other islands who cannot attend the college to have some aid in their difficulties. At present the work is confined to lessons on the selection and preparation of food.

The public schools have as yet no definite scheme in domestic science, sewing being taught in those schools where the teacher wishes. The pillow lace is being taught to some extent in the grades, but more attention is paid to it in the Girls' Industrial School. Several planta-

tion schools have introduced sewing, lace-making and mat-weaving, some specimens of which were exhibited by them at the Seattle exposition.

Another institution which is fulfilling a great need is the Kaiulani Home for Girls. Under the charge of Mrs. Heapy and her assistant, Miss Hosmer, some fifty working girls and school girls from the other islands find a comfortable home for a very small sum. Most of the work is done by the girls, although some few prefer to pay a larger sum and be excused from the work. A night school is maintained for those who wish to attend.

DOMESTIC SCIENCE IN THE NORMAL SCHOOL OF HAWAII.

FLORENCE MARGARET LEE.

The Normal School of Hawaii is composed of Chinese, Japanese, Portuguese, Hawaiian, part Hawaiians, Danes, Germans and Americans. They all speak English fluently and work together in perfect harmony. Honolulu is truly a small "melting pot" of nations.

The diplomas given at the end of a four years' course are of equal rank with those of the California State Normal School and admit a student to the College of Hawaii without examination.

The aim of the school is to train girls and boys to be instructors in any department of the school. With this end in view they spend a third of every day during their sophomore, junior and senior years as assistants in different classes, rotating each week. By this means the graduates have taught each year for six weeks in every grade, for this is also a training school. Daily plans are outlined by the teachers, and the student assistant elaborates these, thereby learning to express herself.

Domestic science was first started in this school on a very limited scale. In 1900 the principal, Mr. Edgar Wood, realizing the great need for it, decided to introduce it into the curriculum. As a special teacher could not be obtained until the department was proved to be a success, the manual training teacher took charge. The grade teachers brought their classes down to the little shed which served as a laboratory, and there the children prepared and ate their simple lunch.

It was about this time that a large fire occurred in the "Chinatown" of Honolulu and from "fire sales" the little shed was equipped as a modest home kitchen. In 1905 this had proved so successful that the department of education erected a small building for domestic science and manual training, equipped a laboratory for each of these, and sent to the mainland for trained teachers.

It was then decided that a lunch should be cooked by the pupils and sold to the teachers and children at a nominal sum. The depart-



THE KITCHEN IN THE NORMAL SCHOOL OF HAWAII.

ment of education furnished all staple groceries and the lunch otherwise paid expenses and grew more and more popular until to-day it is being served to one hundred and fifty people daily.

The aim of this lunch was not to furnish food to underfed children, for extreme poverty did not exist there, but to obtain hand skill in cookery, to create a condition similar to that of daily life, and also to teach how and what to do by *doing*, the reasons to be given as the work was done.

The plan of work is that two girls from the fifth, sixth, seventh and eighth grades of the training school go every morning, according to a rotating system, to prepare the lunch dishes which need long cooking and to make bread. After the first kneading they go back to their classes but return for the second kneading, baking and sponge making. In this way each one actually does all the work, from the making of the yeast to the baking of the loaf.

Next follows the freshman class, so divided that each will have two days per week in the laboratory. In this class, as in all others, there is group work in the preparation of the lunch, the group changing each day to a different table and preparing a different dish. Chowders, soups, meats, vegetables, puddings, pastries, ice cream, etc., are served. For five cents a bowl of chowder or soup, a salad, or perhaps meat loaf with mashed potato, and two slices of buttered bread are sold. The majority make their lunch of this, but for an additional five cents there is ice cream and cake or some dessert. Five cents is the uniform price of all articles.

The cost of food is far greater in Honolulu than it is in New York City, yet this lunch is made to pay all expenses, the superintendent of education no longer considering it necessary to furnish supplies.

A difficult problem in planning this lunch is the consideration of the widely different tastes of the American teachers and the children of these various nationalities, for exactly the same lunch is served to all.

The seventh and eighth grades wash the dishes used during lunch, and thoroughly clean the laboratory. One-half hour is given to this.

An illustration of the kitchen is shown facing page 646.

Sewing is taught in the grades by the grade teachers, and dress-making is taught in the normal department by the domestic science teacher. Like domestic science at the beginning it has a struggle for existence, there being no room and no equipment. It is hoped, however, that both may be secured in the near future.

REPORT OF THE PENNY LUNCH EXPERIMENT IN BOSTON, JANUARY 1 TO JUNE 30, 1910.

ELLEN H. RICHARDS.

At the Boston meeting of the American Home Economics Association the problem of feeding the school child was one of the subjects on the program. The account of the successful work with penny lunches accomplished in other cities stirred into action a long cherished plan of Miss Isabel F. Hyams, trustee of the Boston Consumptive Hospital, to furnish a penny lunch to the children in the Boston schools. With the hearty coöperation of the principal, Miss Emily Carpenter, and the teacher of domestic science, Miss Emmeline-Torrey, the first penny lunches were served in the middle of the morning, at the Winthrop grammar school. The school kitchen was already fully equipped, so that the only expense necessary was for extra mugs, bowls, and trays, and \$3.00 a week for a helper who assisted in preparing the sandwiches. This was supplied by Miss Hyams. On three days of the week, the regular cooking lessons were turned into the preparation of a hot luncheon; on the other two days, sandwiches and milk were offered. About 80 children were served on their school desks, a square of enameled cloth being used for protection. The children marched by the table and took the prepared dishes to their desks. Later the popularity became so great as to outgrow the original equipment and the committee added mugs and covers for 70 more children.

Meanwhile the Boston school committee had asked the Home and School Association to consider what could be done for the five or six-thousand anemic children reported as attending school in the various districts, the greater number being found in the Franklin, Lyman, Quincy, Wells and Hyde districts. The association passed the investigation over to its committee on hygiene, consisting of Ellen H. Richards, Chairman, Isabel F. Hyams, Lillian V. Robinson, and Dr. E. O. Otis.

Investigation revealed that in the most needy districts the school-houses were utterly lacking in facilities. There was no provision for hot water, sinks, stoves or space for the preparation of cooking,

or dishes to serve the food in. Funds for providing equipment for this limited experiment were furnished by Mrs. William V. Kellen, who generously financed the first luncheon experiments in the Boston high schools sixteen years ago and whose interest in the subject has never waned.

The centres established since the Winthrop are the Winchell, Franklin, Quincy and Norcross districts. In the Hyde school a helper was provided.

The Wells district with its nine divisions and most inadequate facilities was helped at the Winchell district by the coöperation of the Elizabeth Peabody House, where Miss Smith prepared the food in the kitchen of the house and sent it to the schools. Forty-five dollars was given to purchase the equipment and first supplies. To the Hyde school was given \$30 to secure oversight and cleanliness in the serving of the two-cent lunch of malted milk and crackers.

At the Franklin school, where the experiment was begun in April, a corner of the janitor's room was curtained off for a kitchen, in which to prepare the food; the stove (gas) was in the furnace room. Here the children come to the basement for their lunches, as in many of the high schools; the food is placed on the tables ready for them, they deposit their money, take the food and pass along. The dishes are returned and washed by the helper and two of the school girls. The luncheon costs two cents in this school, as there is no school kitchen and a helper must be secured to superintend the preparation and serving of the food. This centre was equipped by the committee at a cost of \$55.74 and since April has served 150 children a day.

The Rice school has a public school kitchen so that only the equipment for service mugs, bowls and spoons, was needed, these costing \$23.70. The Norcross school only needed to be supplied with equipment for service, this costing \$5.40. The Quincy school equipment cost \$47.69, and that in the Warrenton St. school cost \$5.40.

For use in all the schools, a piece of crash costing \$6.25 was purchased. For service as needed at \$3.00 per week \$51 was expended. During April and May about 2000 pupils were served, and the total expense has been about \$300.

Once the equipment has been provided the lunches have paid for themselves. This has been made possible only with the strictest management and by the purchase at wholesale of inexpensive food stuffs. About 2000 children are buying luncheons at the 10:30 recess for one or two cents, according to whether the lessons of the cooking

classes can or cannot be utilized. The teachers are unanimous in the belief that the luncheons are helping the children both physically and mentally. They are more attentive and interested in the lessons during the last hour of the morning and the result in their recitations gives the proof. To the earnest coöperation and interest of principals and teachers much of the success of the work is due.

The following dishes have been served: Pea soup with crackers; potato chowder; corn meal mush, with milk, sugar, and crackers; oatmeal and dates, with milk, sugar, and crackers; rice and prunes, with milk, sugar, and crackers; sandwiches (peanut butter, or jam), with a glass of milk; apple-sago pudding; rice pudding; Indian pudding; apple sauce and crackers; ginger cookies, with a glass of milk. The portion fills a large mug or deep oat-meal dish. The food selected has been chosen with care in regard to cheapness and to a high percentage of nutritive value. A distinct advantage was the possibility of buying all food at wholesale prices. The raw material costs one cent (if labor were counted, it would be one cent more) and yields an average of about 300 calories. The milk used is skimmed milk, costing at wholesale about three cents a quart, a valuable food for its cost, differing from whole milk only in the fat. This is made up by butterine, a cheaper product than butter, which has, however, as great a food value and is as easily assimilated in most cases.

The chairman of the committee took the responsibility for the use of these foods. There is probably less danger in this combination than in whole milk as commonly found to-day. The increase of lactic acid organisms in the skimmed milk tends, as Metchnikoff has shown, to crowd out others present, and the conditions of manufacturing butterine or oleomargarine renders it exceedingly improbable that disease germs can have access to the product. Sugar is one of the least expensive as well as the cleanest of foods and is used freely in our lunches. The best authorities apparently agree that under four ounces a day, the child may be allowed it freely. Flour in the form of crackers is also inexpensive and nutritious. Ferguson's bread proved to be well baked and well liked. There is little danger in loaf bread which is crusty and baked through. It is much to be desired that less expensive forms of tasty bread and muffins be provided. A larger patronage and wider experience will doubtless permit of greater variety, if found desirable.

The committee would like to put themselves on record as convinced of the value of the morning luncheon in the elementary school, and of the practicability of its adoption wherever those connected with the

school are prepared to take a little trouble and the authorities will put in the proper facilities—hot water, stoves, and the equipment for service.

There must also be a careful and conscientious supervision by some one with knowledge and authority. Much of the success in Boston, so far, has been due to the indefatigable zeal and thorough knowledge of Miss Hyams, who has given daily oversight to the work and has pulled the laboring oar of the committee's work.

The fact that the product of their lesson is of use to some one has proved an incentive to the classes in cooking and a spur to quick work, and it is in the interest of economical administration that a combination of the school lunch and the work of the school kitchen should some day be worked out.

The parents have, we think, appreciated what we have tried to do for the children. One woman, who earned her living by scrubbing office floors, asked her employer if he would pay her partially in pennies, and when as he told me, surprised at the request, he asked why, she answered, that her grandchildren went to the Winthrop School and they thought so much of their penny lunch, she wanted the pennies for them. Perhaps the best test of our work has been that other schools have demanded also the privilege of lunches. Some are working along the same lines we have followed. We feel encouraged to continue this work and I am sure Miss Hyams must for it is to her generosity of time, personal work and money, that each school as it made its plea of "Will you help us?" owes the details and arrangements. The equipment of bowls, mugs, spoons, cooking utensils and other necessary articles were furnished by the contribution of Mrs. Wm. V. Kellen. Several places however charge two cents for their lunches as they are either boys' schools or girls' schools with no school kitchen in the building.

The work is, then, done by one woman who gives her entire morning to the work, and the extra penny pays her salary. Our school was provided with an assistant whose salary was provided for by Miss Hyams.

If any of you can find a generous friend, sympathetic helpful principal, coöperative fellow teachers, and willing capable girls like ours I would suggest that you also start penny lunches and see how much pleasure they will give you in spite of the additional work, but you can not omit one of these elements and spell Success.

This lesson in inexpensive nutrition is of distinct value to the child and to the community. For the parents it is also an important lesson that not only food but the right food is necessary. To those who give

little children a penny to spend without any suggestion as to what to buy with it or where to buy it, this extreme care given to a luncheon must be a revelation and, in time, must tell for good. Careless parents do not notice when the child does not eat a nourishing breakfast, and even if a luncheon is taken it is frequently not appetizing and in many cases it is cold. The chairman of the committee believes that in the winter, at least, a cup of hot food acts as a mild stimulant to the digestive juices, so that the real value of the luncheon is doubled.

One of the worst habits of children of this early age is the patronizing of the candy and pastry shops. Sugar is valuable if it is pure, since it goes so quickly into the circulation without taxing the body fluids, and there is a reason for the child's liking for candy, but it should be of the best quality. This recess lunch does not interfere with a parent's responsibility, because it comes at a time when they cannot provide more than the money, which they nearly all do, but it insures real nutrition for the penny. From it the parents may learn the value of foods and the children will learn to choose such things as are good for them to eat in the midst of school hours.

The committee deprecates the giving of supplies to a school. It believes the children should pay for what they get and that the price should be in proportion to the cost for this very reason—the teaching of values. If anything is to be given, it should be the equipment, which is the public property of the school and lasts for some years.

To-day education cannot take cognizance simply of intellectual matters, but must recognize the attainment of the child's efficiency through the physical side as well. The hundreds of children who have had six weeks' feeding in these schools show the results in increased weight, better color, and more receptive and active minds.

The time of eating and quality of food does not interfere with the noon meal nor has it lessened the furnishing of breakfast, in any observed cases, by parents. It seems to be a feasible remedial-preventive measure, involving no serious odors or garbage about the school house.

One criticism is sure to be made on the handling of these luncheons in school buildings by the regular teachers not dressed in cooking-school costume. That the standards of superficial nicety are not kept up might be said, but it would raise the cost, since it is the polish and specklessness that doubles or even trebles the price of prepared foods.

The service, though simple, is educational, as everything is done in

good taste and in a cleanly way. It is carried out with little friction. In the Winthrop school, word is sent the day before to the kitchen as to how many lunches each room desires. At the close of the afternoon, trays are placed about the room, each in its assigned place, so that there shall be no confusion and all will be in readiness for the next morning. When ready the trays are carried to the various rooms, and the food served at the desks, each child having a doily of enamel cloth. When bread or a cracker is served with milk a disc of metal instead of a plate is placed on top of the mug to hold the bread. . . When the children have finished, the mugs are collected, returned to the kitchen and washed by the children.

WHAT SHALL BE DONE ABOUT IT NEXT YEAR?

An extension of this work might be taken up for the "shut-outs." It has been reported that several hundred children in the city are locked out of their homes at noon and left to roam the streets. It was hoped in the Hyde School that a noon class might be formed to prepare their own noon meal and, perhaps, prepare a part at least of the penny lunch, but various obstacles prevented the trial. It is hoped that some such plan will be inaugurated somewhere next year. Further work of hygienic value should be undertaken in coöperation with this work to provide hot water and towels, or, in other words, possibilities for clean hands in the school. Clean food eaten from dirty hands is of little avail.

This is but a part of the whole social problem—and the "break-fastless" child is the result of bad hygienic conditions of the modern tenement house rather than of poverty or the unsolicitous mother—for there are not many of the latter.

The committee feels certain of the splendid results obtained, and believes the work should be extended, emphasizing, as an important factor towards its success, first, constant supervision by one who has a knowledge of food values and prices and the place of food in the modern educational scheme, and, second, the necessity of funds to draw upon for equipment in starting the work promptly and efficiently.

Miss Lillian M. Towne has been recently added to the committee and much is hoped from her intimate knowledge of the school needs and conditions.

ACETYLENE GAS AS FUEL FOR A DOMESTIC SCIENCE KITCHEN.¹

MISS JOAN HAMILTON.

Supervisor of Domestic Science, Regina, Saskatchewan.

The public school board brought me here last summer to introduce domestic science to the schools of the city. The first thing was to equip a class-kitchen. My board was willing to provide everything necessary for a good equipment, but my nearest neighbor in domestic science was across the prairies in the next province, and the dealers required a good deal of education in the "fitness of things." Most of our difficulties have now been overcome and we have made a satisfactory beginning with the two branches of sewing and food preparation.

Our greatest problem was to provide satisfactory individual stoves for twenty-four girls around the ordinary hollow square table, and the following notes on our experience may prove helpful to other pioneer teachers in similar circumstances.

Choice of fuel.—Coal gas was impossible. Many were the kerosene stoves offered, but most of them were too high and too unstable. One looked promising, but proved difficult to control and the possibility of twenty-four of them pouring black, greasy smoke into the room was too much for the board. Satisfactory alcohol stoves could be had but denatured alcohol is \$1.50 a gallon, and the board finally decided upon acetylene gas.

Plumbing, etc.—This was the same as for ordinary coal gas, but with a different burner in the stoves.

The stove.—An individual stove with 3-inch legs, the flame-bars arranged spoke-shape and encircled by an iron ring 8 inches in diameter. This is the stove on the market, which we have modified to our use by cutting off the legs as short as possible and fastening an iron plate over the top to hold small pots. The flame bed is far too large

¹ Presented at the Boston Meeting of the American Home Economics Association, January, 1910.

and we are devising means to cut the gas off from the end holes of the spokes until such time as the manufacturers put a small stove on the market. This stove is made in the United States.

Cost of installation, including the machine, stoves, plumbing, etc. was \$317.40. In this connection it might be remembered that western prices for both goods and labor are high in comparison with eastern prices.

Carbide.—Rice carbide could be purchased in Merritton, Ont., at \$100 per ton laid down in Regina.

Management.—This is very simple. There is no storage chamber in our machine. The janitor turns a stop-cock at the machine and when the stoves are lighted the gas generated. The janitor removes the sludge three times a week and puts in as much water as he removes sludge. Full and clear directions accompany the machine.

In lighting the burners we had at first some trouble with the flame flashing back. This is a very noisy and nerve-racking thing, but is overcome as soon as the operator learns to light the burner properly.

Feasibility as a class-kitchen fuel.—Acetylene is much cleaner than coal gas, with a more even and certain heat, and the heat is very intense. So far I like it much better than coal gas and think it will prove a superior fuel when we get a suitable stove. At present we have twelve inches of flame when two inches would do the work.

Cost of running in comparison with ordinary gas.—We cannot yet make satisfactory comparisons. The plant has been running but a short time and as it is something new the members of the board bring many visitors. Each time one or more burners are lighted and I am not always at hand to note the length of time they are in use. Again, there was at first a considerable leakage through an undiscovered sand-hole in a basement pipe. We are, however, planning to keep careful account of the amount of carbide used in a given time for a given number of students. At present our belief is that it is not an expensive fuel.

NOTE ON THE SETTING OF GELATINE.

OLIVE GAIR PATTERSON AND C. C. BENSON.¹

Laboratory of Physiological Chemistry. University of Toronto.

A number of factors are said to influence the formation of a good jelly from gelatine, such as the need of a small amount of calcium and the avoidance of continued boiling. Experiments have therefore been undertaken to study these factors and to learn how far they do influence the gelatinizing power.

In the first place pure sheet gelatine was used as being the purest commercial product obtainable. This contained 2.2 per cent of mineral matter and gave positive tests for calcium. If calcium is necessary to the setting of gelatine as it is for the clotting of milk and coagulation of blood, continued washing to remove the ash (and in it the calcium) should destroy the power of forming a jelly. This was not found to be the case. The gelatine was dissolved in water (2 gms. in 100 cc.) and washed in many changes of distilled water for some days and dialyzed for several days more against distilled water. Four weeks of such treatment produced a gelatine containing only 0.01 per cent of ash and yet forming a good jelly. The ash in this case was obtained by carbonizing, extracting any soluble mineral matter, and then ashing the residue. The extract contained no ash, all the mineral matter being in the insoluble part.

The gelatine used gives a good tyrosin (oxyphenyl) reaction with Millon's reagent, although the tabulated records of gelatine composition show the absence of tyrosin. Tyrosin seemed therefore to be an impurity in the brand used, but was also found in other commercial specimens tested. The washing for four weeks with distilled water and dialyzing with distilled water did not produce a gelatine giving a negative Millon's test, but on dialyzing another solution of gelatine (2 gm. in 100 cc. hot distilled water) against running tap water for four weeks, it was found that the solution no longer gave

¹ Presented at the Boston Meeting of the American Home Economics Association, January, 1910.

Millon's test. The solution had, however, become diluted. When it was carefully evaporated down on a water bath and left in the cold it set into a clear, firm jelly. Gelatine may, therefore, be freed of its mineral matter and tyrosin-holding impurities without affecting the gelatinizing power of its solutions.

The influence of boiling on gelatine solutions has also been tested. Two grams of gelatine dissolved in 100 cc. of distilled water were boiled under a reflex condenser. After one hour's boiling the solution still set into a firm jelly. After five hours it formed a jelly but not so firmly. After seven hours, a soft jelly formed on standing over night, and after ten hours a soft jelly could be formed only by concentrating to half the volume. A process of hydrolysis had evidently been going on, for on "salting out" these solutions with ammonium sulphate at half saturation and complete saturation, different fractions are obtained. After one hour's boiling the first fraction is larger than the second but after five hours boiling the second fraction is the larger. After five hours boiling even complete saturation with ammonium sulphate leaves in solution a body which gives a positive biuret reaction. A few minutes boiling did not at all injure the jelly-forming power but made a clearer jelly when the mixture set.

Further experiments are being made to test the effects of boiling and some tests have already been made with solutions containing citric and acetic acids, since in jelly-making processes acids from fruit juices are generally present. Four per cent gelatine solutions containing citric acid to a concentration of one per cent still set in the cold after fifteen minutes boiling but after ten minutes boiling of a three per cent solution with 0.5 per cent citric acid the gelatinizing power had been considerably decreased. More work is needed before definite results can be obtained and this will, we hope, be done during the coming session.

A DAY'S METABOLISM.¹

C. C. BENSON, M. B. TAMBLYM, AND STUDENTS.

University of Toronto.

In the spring of 1907 some experiments were made in the hourly examination of renal excretions. The value of these experiments was much increased by a knowledge of the nitrogen intake. The household science department kindly provided a day's meals on two occasions and furnished data giving all necessary information. The amounts of food eaten were carefully weighed, their composition assumed from Atwater's tables, and the nitrogen content calculated accordingly. The meals were taken from sets of meals, the actual food for which could be purchased in Toronto at 25 cts. per person per day. The meals were prepared and the weights determined.

In the experiment here referred to, the breakfast consisted of farina with dates, omelet, graham muffins with butter, toast, coffee and milk. The dinner was soup, roast beef, potatoes and cabbage, potato biscuit, Spanish cream and water; and the supper was baked beans and brown bread, fruit salad with maple biscuits, butter, tea, milk and sugar. This made a total weight of 2022 gms., giving 1540 gms. of water, 72.25 gms. of protein (11.56 gms. nitrogen), and 2212 calories of energy.

The urine was collected at intervals of about one hour from 7 a.m. to 7 p.m. on the day of the experiment and also in toto for the 24 hours. The samples were analyzed as required by the nature of the experiment. The total excretion amounted to 1248 cc. and contained 9.74 gms. of nitrogen. The fecal nitrogen amounted to 1.38 gms. There was therefore, a nitrogen balance of +0.44 gms. for the 24 hours. Phosphorus determinations were also made by titrating with standard uranium acetate solution. The total excretion of phosphorus for the 24 hours was 0.70 gms. The sodium chloride excreted was 7.2 gms.

We have here only outlined a single metabolism experiment for one day. Others of a similar kind have been undertaken with the coöperation of the household science and physiological chemistry departments, in some of which the whole work has been carried on by students. We hope to continue such experiments and feel that these two departments can be of great assistance to each other in such ways.

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A REVIEW OF RECENT SCIENTIFIC LITERATURE BEARING ON DOMESTIC ART.¹

C. F. LANGWORTHY, PH.D.

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For many years American investigators and teachers have made a systematic attempt to follow the reports of experiments which have to do with the general subject of food and nutrition. Such work is very extended and constantly increasing, as may be seen by comparing the amount of space it now occupies in such reference journals as the *Experiment Station Record* and *Chemical Abstracts* with that required in earlier volumes. Furthermore, a great deal of attention has been paid to collecting and summarizing the literature of food and nutrition in connection with the nutrition investigations of the Office of Experiment Stations. Perhaps it was because food and nutrition bore so obvious a relation to well established branches of science such as medicine, physiology, physiological chemistry, and physics that the workers in this subject naturally followed the methods with which they were familiar in the study of the older and more well established branches. Then, too, it must be said that although much of the literature pertaining to the subject of food and nutrition is published in foreign journals and reports not usually found in libraries in the United States, a large part of it can be found in journals which are well known and readily accessible. A fairly extended survey of scientific journals, reports of learned societies, and similar material leads to the conclusion that scientific literature bearing on domestic art is more scattered and less easily accessible.

Just why this should be the case it is difficult to say, but the fact remains that no attempt comparable with that made in the case of nutrition has been made to collect and digest systematically the scientific material which bears upon the subjects included under the general heading domestic art. Perhaps one reason is that what we

¹ Presented at the Third Graduate School of Home Economics, Ames, Iowa, July, 1910.

know as domestic art has such an obvious relation to æsthetics and to the fine arts in general, as well as to technical subjects related to the principal activities of the home, that the teacher has found a sufficient amount of material of this character to provide extended courses of instruction and has not been forced to fall back upon the laboratory for fundamental facts in the same way as the teacher of physiological chemistry. Be that as it may, it is certainly true that domestic art may be approached from the laboratory and that it must be if it is to mean more than discriminating taste and skill in household activities. It is well recognized that it does mean more than this, as is obvious from the character of the work which is being carried on in so many of our schools and colleges.

Since domestic art has to do with such a wide range of topics and so many materials, it is to be expected that numerous branches of science would contribute facts of interest to the domestic art student. Even a cursory survey of current scientific and technical literature shows that such is the case and that a wealth of material is being provided which only needs gathering and interpretation to prove of great value. With the idea of finding out something of the character and extent of this material the attempt has been made in this paper to bring together references to recent literature which seem of importance in the discussion of domestic art problems. It is recognized that the list of references is not complete and that the result is not all that might be desired. It is hoped, however, that enough has been done to prove the correctness of the contention that current scientific literature contains much material of fundamental importance to the domestic art teacher who wishes to see the subject recognized as one which is as worthy of serious study as engineering, medicine, or other branches of learning, and one which may be approached by similar methods.

For convenience the material collected has been grouped under a number of general headings such as textiles and clothing, laundry materials and methods, building materials and household articles, illuminants and fuels, and hygiene and the home.

TEXTILES AND CLOTHING.

The value of textiles for use as clothing is dependent upon a number of physical properties, one of which is the permeability to air. From a theoretical standpoint this is a physical problem which is

dependent upon the laws governing the passage of gases through capillary tubes or openings, cloth being, of course, for all essential purposes a system of very short capillary tubes. At the Hygienic Institute of the University of Leipsic, P. Schmidt (*Arch. Hyg.*, 70, 1909, No. 1-2, p. 8) has studied this problem and expressed his results in mathematical form. He concludes that under experimental conditions the passage of the air through the cloth followed the law for capillaries, the quantity of air passing through being proportional to the pressure and indirectly proportional to the resistance. When expressed in the form of curves the results with thin cloth with open meshes, such as flannel, batiste, etc., showed that the curves were combinations of straight lines and parabolas. A practical conclusion from the work is that materials differ in their resistance to the passage of air currents, that this resistance is a measurable quantity, and that it should be taken account of in the rational selection of clothing for different climates and different conditions. The experimental method is described and could be easily adapted to students' laboratory work.

K. B. Lehmann and J. Siegler (*Arch. Hyg.*, 66, 1908, No. 4, p. 297) have studied the relative power of woolen and cotton to absorb perspiration, particularly with reference to the use of cotton and woolen stockings in the German Army. They conclude that when cotton stockings are worn over woolen stockings the perspiration is quickly withdrawn from the woolen, since cotton has a decidedly great power of absorbing water and the feet do not remain damp. When the conditions are reversed and the cotton is worn next the skin the moisture remains in the stockings as wool does not withdraw it readily from the cotton and carry it off. The results are discussed particularly with reference to Cramer's conclusion that the readiness with which sodium chloride in perspiration passed through clothing is an important factor in considering its hygienic value. Cramer's work, which was published in 1890, had to do with the relation between clothing and the functions of the skin.

The results of such investigations as these are very important for the intelligent discussion of the problem of clothing. Those who attended the Summer School at Ithaca will recall that Prof. Zuntz spoke at length of his work on clothing in relation to comfort and his conclusion that a double-faced cloth was preferable for severe exercise, the upper surface being of such a nature that it would absorb the moisture given off by the body and permit much to be readily evaporated, while the under surface, which had opposite properties,

would hinder a sudden chilling of the surface. He called attention to the fact that the material was less important than the character of the fabric and that with modern factory methods it was possible to treat fibers in such a way that both qualities could be obtained with the same material and that an all-wool or all-cotton fabric could be made which was double-faced and would fulfil the desired conditions.

The relative value from a hygienic standpoint of clothing of different colors in intense sunlight was studied at the Hygienic Institute of the University of Leipsic by P. Schmidt (*Arch. Hyg.*, 69, 1909, No. 1, p. 1). A full account of the experimental methods which he followed is given in his report. Of thick materials through which air does not pass readily, that is, such goods as are often chosen for summer clothing or such as are often worn in the tropics, he concludes that white is more hygienic than dark colors. In the case of thin materials through which air readily passes, preference is to be given to dark materials, provided the clothing is loose and does not hang close to the body; in other words, by such garments as the Japanese kimono, the thin silk pajamas, and similar garments which are commonly worn in the tropics. The ventilation of such clothing is affected not alone by its porosity, but also by wide sleeves and loose trousers.

Sunstroke, the author concludes, is not caused by the ultraviolet rays, as has been claimed, but to the fact that the bright rays of light penetrate deep into the body, and being absorbed, are converted into heat. In a study of the efficiency of various sorts of clothing as protection against sunstroke, his conclusions are not favorable to the English goods which have been advocated, which are white on the outside and red underneath.

Many other questions which have to do with clothing in hot climates and hot seasons are also studied and the investigation as a whole is a good illustration of the attempt to study the hygiene of dress by scientific methods.

A reference to this problem naturally suggests the elaborate discussion of the question of protection by the color of the skin, the protective power of clothing, and other similar questions which have to do with life in the tropics included in the volume recently published by Major Charles E. Woodruff, of the U. S. Army, entitled *Expansion of Races*. He has also published a paper on *The Effects of Tropical Light on White Men*, which is concerned with the same question. Major Woodruff's conclusion is that owing to the color of their skin, the brown and black races are naturally protected from the harmful

effects of the bright sunlight of the tropics, and that it is impossible for the white races to attain a complete immunity by special clothing or other modifications of their usual living conditions.

There are many other questions having to do with fibers and textiles which have been studied experimentally, including dyes and dyeing, the action of light on color, the detection of adulteration of fibers and fabrics, and similar topics. In summarizing such work mention should be made of L. A. Olney's volume on *Textile Chemistry and Dyeing* (Chicago: Amer. School of Correspondence, 1909, pp. xi + 343), and Prof. J. M. Matthews' *Laboratory Manual of Dyeing and Textile Chemistry* (New York: John Wiley & Sons; London, Chapman & Hall, Ltd., 1909, pp. xii + 363). An interesting theoretical discussion of the dyeing of textile fibers is presented by S. H. Higgins (*Chem. News*, 99, 1909, No. 2576, p. 169) in a recently published paper.

A paper by P. G. Jones (*Jour. Soc. Dyers and Colourists*, 26, 1910, No. 6, p. 147), entitled *Some Observations on the Action of Light on Finished Dyed Cotton Goods*, is of decided interest in connection with the wearing quality of colored goods, and it seems fair to say that such data as the author reports must be taken into account in an intelligent discussion of the selection of materials and permanency of color. It is the generally accepted theory that the fading of color on exposure to light is due to an oxidation process, and this question is discussed by Jones, and some data reported which have to do with the theory that perhaps reduction may also be involved. As regards the technique of cotton dyeing, he found that the use of dextrin with alizarin oil in finishing had a very favorable effect on the fastness of color.

Papers of similar character to the one noted are very numerous and are published in such journals as the *Journal of the Society of Dyers and Colourists*, issued at Bradford, England. Some of the abstract journals include such work.

The study of the detection of the adulteration of fabrics reported by Miss Nellie Crooks (*Harper's Weekly*, 54, 1910, March 5, p. 11) is of course familiar to all and is a good example of a paper which is of importance from a practical as well as from a laboratory standpoint.

As a contribution to the subject of the examination of textile fabrics may be mentioned G. Tagliani's paper (*Rev. Gen. Mat. Color.*, 13, 1909, p. 221; abs. in *Chem. Abs.*, 3, 1909, No. 22, p. 2755) on methods of the Italian Customs Service for detecting sizing in cotton goods. The official method is described and a modification proposed.

A discussion of the question of the subject of fibers and textiles should take account of at least a few of the volumes which have been published on this subject in recent years. In *The Structure of the Wool Fiber and its Relation to the Use of Wool for Technical Purposes* (London: Macmillan & Co., Ltd., 1908, pp. xx + 475), F. H. Bowman discusses classification of fibers, the origin and development of the hair, and a great variety of questions concerned with the wool raising industry, the chemical composition of wool, the action of reagents on wool, theory of dyeing and color, and related questions. Attention is especially directed to his chapter on methods of analysis and the detection of various fibers.

Daniel Zolla's book on textile fibers of animal origin (*Les Fibres Textiles d'Origine Animale*, Paris: O. Doin et Fils, 1910, pp. ix + 362) is a fairly exhaustive study of wool and other fibers from an industrial and statistical standpoint, though a considerable amount of scientific data are also included.

A very important work on this subject which was published a little earlier than most of the material referred to in this summary is Prof. J. M. Matthews' volume entitled *The Textile Fibres: Their Physical, Microscopical and Chemical Properties* (New York: John Wiley & Sons, 1907, pp. viii + 480; London: Chapman & Hall, Ltd). It contains data on the chemical nature and properties of wool and hair fibers, silk, cotton and other vegetable fibers, mercerized cotton, artificial silk, and chapters on the quantitative and qualitative analysis of textile fibers.

Though published somewhat earlier than the bulk of the material included in this summary, it seems desirable to mention Bersch's volume, translated from the German by W. T. Brannt, entitled *Cellulose, Cellulose Products, and Artificial Rubber* (Philadelphia: Henry Carey Baird & Co; London: Kegan Paul, Trench, Trübner & Co., Ltd., 1904, pp. xxi + 345). This volume treats of the preparation of cellulose from wood and straw; the manufacture of parchment; methods of obtaining sugar, alcohol, and oxalic acid; the production of viscose and viscid, nitro-celluloses, and cellulose esters, artificial silk, celluloid, rubber substitutes, oil-rubber, and factis. In other words, this volume supplies a great amount of information regarding the manufacture of mercerized goods, artificial silk, and many other similar products, including their chemistry and technology.

LAUNDRY MATERIALS AND METHODS.

Many investigators have studied problems which have to do with the materials used in the laundry or with the processes which are applied in laundry work.

W. Kind (*Die Wirkung der Waschmittel auf Baumwolle und Leinen*. Wittenberg, 1908; abs. in *Ztschr. Chem. u. Indus. Kolloide*, 5, 1909, No. 2, p. 84) studied the effect of various washing materials on cotton and linen and reached the conclusion that not only did water glass (sodium silicate) injure fibers, but many other alkaline substances such as soda. The rapid destruction of garments, etc., in laundries, he states, is not always due to the use of chlorin as a bleaching agent but very often is to be ascribed to the action of alkali. It is doubtless well known to all familiar with laundry processes that excessive alkali is injurious, but nevertheless it seems not uninteresting to be able to substantiate opinions by the results of carefully conducted laboratory work.

Data on the detergent power of soaps have been reported by W. Spring (*Ztschr. Chem. u. Indus. Kolloide*, 4, 1909, No. 4, pp. 161-168). The experiments reported in this paper have to do with the methods and theories of colloidal chemistry, and it is difficult to present the material satisfactorily in the limits of a brief abstract.

Of interest in connection with laundry work are such papers as Dafert's and Wolfbauer's study (*Oesterreichische Chemikerzeitg.*, 1908, No. 12; abs. in *Ztschr. Chem. u. Indus. Kolloide*, 5, 1909, No. 2, p. 84) of the effect of resin soaps, which they conclude are of less value than pure fat soaps and which impart a distinctive color to fabrics washed with them.

J. Leimdorfer (*Augsburg Seifensiederzeitg.*, 35, 1908; abs. in *Ztschr. Chem. u. Indus. Kolloide*, 5, 1909, No. 2, p. 84) studied experimentally the effect of different materials used in laundry work.

The disinfecting power of soap has been frequently studied, and perhaps the mention of a paper on this subject published by H. Reichenbach (*Ztschr. Hyg. u. Infektionskrank.*, 1908, pp. 296; abs. in *Ztschr. Chem. u. Indus. Kolloide*, 5, 1909, No. 2, p. 84) will suffice for an illustration of such work. In general, it was shown that the disinfecting properties are dependent upon both alkali and the salts of fatty acids obtained from the hydrolytic cleavage of the soap rather than from either group alone. These papers and many others which have to do with soap are included in an annual review of the soap

industry by F. Goldschmidt (*Ztschr. Chem. u. Indus. Kolloide*, 5, 1909, No. 2, pp. 81-85), published in a German journal devoted to chemistry and colloids, a journal which seems well worth the attention of students of all branches of Home Economics, as the newer theories which are brought together under the head, Colloid Chemistry, have a wide application in many of the subjects which pertain to plant and animal life as well as many industrial processes.

The question of the nature of the soapsuds or the soap bubble is one which seems to interest many persons. It can be better answered by reference to investigations of this subject which have been brought together by C. Stiepel (*Augsb. Seifensiederzeitg.*, 35, 1908, pp. 331, 396, 420; abs. in *Ztschr. Chem. u. Indus. Kolloide*, 5, 1909, No. 2, p. 84). It appears that the formation of suds is dependent upon a condition of dissociation in the soap, that is, upon the presence of water-soluble soap and free fatty acid or acid soap. The presence of free alkali is a help when it insures a sufficient amount of soap in water-soluble form, that is, by reversing the dissociation of the soap, which would continue until a condition of complete insolubility was reached, provided all the free alkali was removed.

The question of the disinfection of clothing and other materials, dwellings, etc., is receiving a great deal of attention at the hands of investigators. As an example of such work may be mentioned G. Sobernheim's paper (*Arch. Volkswohlfahrt*, 2, 1909, No. 12, pp. 708-717; 3, 1909, No. 1, pp. 12-14) on newer methods of house disinfection which summarizes data on the subject and directs attention to the great advance which has been made since formaldehyde has been available as a common market commodity and satisfactory methods have been found for using it.

The question of the efficiency of ordinary laundry methods as sterilizing agents is one which often arises and apparently is generally answered by an expression of opinion one way or another, most persons holding that the soapsuds and hot water used in washing clothes and the heat required in ironing them should be fairly efficient. However, we are apt to recall that the period of immersion in hot water may be short and that the mangles and ironing machines employed in laundries may not be hot enough or used for a long enough time to insure sterilization. It is therefore of interest to know that K. Svehla (*Arch. Hyg.*, 70, 1909, No. 4, p. 373), of the Hygienic Institute of the University of Prague, studied the disinfecting power of pressing with a hot iron, particularly with reference to its use in disinfecting the

clothing of physicians and attendants in cases of contagious diseases. He concludes that pressing with a hot iron is a simple and good method of sterilizing clothing and states that in his own practice he uses a long linen coat or mantle which is sprinkled and pressed each time it is used. Such a coat can be worn in the sick room and left with the family for pressing. This does not involve a great amount of work, and it seems a simple prophylactic measure.

Bleaching, as every one knows, is an important laundry process and will be the better understood by one who is familiar with K. J. P. Orton's and W. J. Jones' study of A Crystalline Bleaching Powder (*Jour. Chem. Soc.*, London, 95, 1909, I, p. 751), which was recently published.

Papers which have to do with drying machines for chemical work have been reported by W. B. Ruggles (*Met. Chem. Eng.*, 8, 1910, p. 177; abs. in *Chem. Abs.*, 4, 1910, No. 12, p. 1655) and W. E. Wadman (*Met. Chem. Eng.*, 8, 1910, p. 176; abs. in *Chem. Abs.*, 4, 1910, No. 12, p. 1655). As these papers have to do with conditions which effect efficiency, they are of possible interest in connection with devices for drying clothes in laundries on a commercial scale or in the home or farm laundry. Fortunately, the possibility of equipping the home or farm laundry with mechanical devices which lessen labor has been demonstrated by work such as that of Washburn.

BUILDING MATERIALS AND HOUSEHOLD ARTICLES.

No one can deny that the most intelligent use of building materials depends upon a knowledge of their chemical and physical properties. A great deal of work is being published at the present time which has to do with the character of cement and with various problems concerned with its use. Similar work is also published regarding asphalt, wood products, and other materials. Papers of this character are published in a great variety of journals and reports, but the work is regularly abstracted in *Chemical Abstracts*, published by the American Chemical Society. As an example of the work with wood may be mentioned H. Wislicenus' paper (*Z. Chem. u. Ind. Kolloide*, 6, 1910, pp. 17, 87; abs. in *Chem. Abs.*, 4, 1910, No. 12, p. 1621) on The Colloidal Processes of Wood Formation and the Nature of Wood and Lignin. The author discusses from a physiological and theoretical standpoint the nature of wood, lignin, and the wood-building process. Wood, he states, considered after the original cellulose formation in the plasma,

is the result of colloidal chemical processes, dependent on gelatinization and colloidal absorption. Lignin is one of the colloids precipitated from the sap, of which one part enters reversibly, and the other part irreversibly, the cellulose structure. Early spring sap shows a low colloid content which increases as the leaves of the tree of plant develop, while sap in July and August, during the growing period, is high in colloids.

As an example of another sort of work may be mentioned a paper on Treating Timber with Crude Petroleum as a preventive of decay, which was published by C. M. Taylor (*Chem. Eng.*, 11, 1910, p. 35; abs. in *Chem. Abs.*, 4, 1910, No. 12, p. 1667), and the question of The Strength of Treated Timber embodied in the Report of the Committee on Wood Preservation of the American Railway Engineering and Maintenance of Way Association (*Chem. Abs.*, 4, 1910, No. 12, p. 1668).

Glass, pottery, and porcelain are of great interest and importance in the home, from the standpoint of decoration as well as that of utility. Technical studies which have to do with these materials are numerous and are well worth the attention of students and teachers. As illustrations may be mentioned the paper on The Foundations of Stained Glass Work by N. Heaton (*J. Roy. Soc. Arts*, 58, 1910, pp. 454, 485; abs. in *Chem. Abs.*, 4, 1910, No. 12, p. 1658), which contains chemical formulae which have to do with the technique of stained glass, and likewise with the chemistry of the ground or sheet glass, the pigments, metallic oxids, etc., used to give color, and the technique of fusion, etc., and also include the chemistry of the processes involved.

A contribution to the same subject is made by E. Grieshammer (*Sprechsaal*, 43, 1910, pp. 153, 165; abs. in *Chem. Abs.*, 4, 1910, No. 12, p. 1658) in his paper on The Solubility of Metallic Sulphides in Glass.

The effectiveness of insulating materials is a matter which concerns the household as well as the cold storage industry. It is self-evident that the heating problem in the home is a question of insulation, as is also the problem of the effectiveness of a refrigerator or ice chest. For this reason such a paper as W. D. A. Bost's (*Cold Storage and Ice Assoc. Proc.*, 8, 1909, No. 2, p. 89), entitled Apparatus for Determining the Conductivities of Insulating Materials, is of interest. This gives an illustrated description of the apparatus and methods employed in discussing insulating problems with special reference to cold storage, but the apparatus and methods could be easily adapted to the study of household materials by students in the laboratory.

W. Hoffmann (*Arch. Hyg.*, 68, 1908, No. 1, p. 54), at the Hygienic and Chemical Laboratory of Emperor Williams's Academy for Training Army Physicians, studied the heat conducting power of linoleum of different sorts and found that the conducting power of linoleum was dependent upon the proportions of cork and linoxym used in its manufacture. The linoleum which was poorest in this respect was a much better conductor of heat than wooden flooring and it was therefore the less efficient for this purpose. Wooden floors without linoleum were found to be poorer conductors of heat than floors made with a thick layer of plaster-of-Paris compound covered with linoleum. These investigations are of interest not only for their obvious relation to the economical heating of houses or other apartments and the comfort of warm floors but for the information they give relative to experimental methods.

ILLUMINANTS AND FUELS.

H. Benndorf and W. Prausnitz (*Arch. Hyg.*, 66, 1908, No. 4, 384), at the Physical and Hygienic Institute of the University of Graz, have studied the illumination of rooms by sunlight and described apparatus for estimating the proportion of light and shade under different conditions.

The relative hygienic value of different methods of artificial illumination is a very important matter and one which has to do not only with health but also with problems which pertain to ventilation. S. Rideal, in *The Relative Hygienic Values of Gas and Electric Lighting* (*Jour. Roy. Sanit. Inst.*, 29, 1908, No. 2; also published in book form), has reported a comparative study of the hygienic value of gas and electric lighting with special reference to the condition in dwellings. In this work he has taken into account structural and lighting conditions, ventilation, the character and distribution of products of combustion and respiration, organic matter in the air, effects of gas leaks with special reference to carbon monoxid, physiological data such as pulse rates, respiration frequency, blood pressure, the number of blood corpuscles, animal heat and body temperature, body weight, mental fatigue, time reaction, eye fatigue, and other similar data, and a special experiment as to the poisonous effects of coal gas. Not only does his report represent a large amount of interesting original work, but it may also serve as a manual for the study of such problems since methods are described in considerable detail.

Quotations from the author's discussion of his results indicate the character of the conclusions which were drawn from his observations:

With natural ventilation the proportion of carbonic acid in the air was practically identical for both illuminants (gas and electricity).

The ventilating effect of the gas burners has thus proved competent to carry off the whole of their products, or an equivalent amount of the products of respiration.

It is therefore not surprising that the search for the physiological effects of lighting by gas has been in the main a fruitless one.

The fifteen men have been subjected on more than fifty occasions to some 6,000 tests of the kind best calculated to detect any such falling off in condition as might be expected to take place under either mode of illumination. The results of these tests have been carefully examined and averaged, and, with few exceptions, they absolutely fail to disclose any measurable difference between one mode of lighting and the other. Not only so, but in no case do they show any deviation from any normal conditions. It is not merely that the changes noted were well within the limits of accommodation. If this were all it would be a very poor answer to the question propounded, for it would obviously be unsatisfactory that a system of lighting should trench, no matter how slightly, upon that power of accommodation on which the body depends to safeguard it in the presence of adverse influences. Not only were the limits of accommodation never exceeded, but they were in no case even distantly approached, and the conditions which the physiological tests disclosed were in all cases entirely satisfactory. The differences found between the two lights were so small as to be absolutely devoid of any hygienic significance; they were, in fact, much less than those that are constantly produced in healthy subjects by slight changes in their condition or environment.

There may be, and doubtless are, persons so peculiarly constituted as to find one light or other objectionable, or even to be unable to tolerate any artificial light whatever. Such cases belong to the domain of pathology rather than that of hygiene. On a review of the whole of the facts collected, it may be said, without reservation, that there is nothing is either mode of lighting which is incompatible with the best hygienic conditions.

Owing to the better ventilation obtained by gas, the products of combustion are not found in the air in anything like the proportion which might be expected, the temperature and humidity in an occupied room being no greater than when the room is lit with electric light.

Carbonic acid has not the injurious effect which was formerly attributed to it, but considerable rises in the temperature and moisture content of a room, from whatever source, do have a prejudicial effect upon the well-being of the occupants. Even under adverse conditions of ventilation purposely created for this inquiry, neither the temperature nor percentages of moisture in the room reached a point at which any such effect could be detected by any of the recognized physiological tests.

It has been established that the products, viz., heat, carbonic acid and moisture, so far as they modify the health of the occupants of a room, are derived from the inmates more than from the illuminant, and that a room of moderate size can be efficiently lighted by gas without sensibly affecting the amount of these three factors.

The medical conclusions are in accord with those arrived at from the chemical and physical data, and also demonstrate that the choice between the two systems of lighting does not depend upon hygienic considerations.

The practical testing of gas and gas meters has been considered by C. H. Stone in an exhaustive manner in a recently published volume entitled *Practical Testing of Gas and Gas Meters* (New York: John Wiley & Sons; London: Chapman & Hall, Ltd., 1909, pp. x + 337). It is doubtless unnecessary for pupils to learn the technique of gas testing, but the teacher who is familiar with such works as this will without question be able to give clearer explanations of the vexing question of the gas meter.

The fuels of the household have been considered by Marian White (Boston: Whitcomb & Barrows, pp. 97) in a recently published volume which presents an interesting and valuable summary of available data.

HYGIENE IN THE HOME.

In preceding sections, articles have been cited which have to do with various questions of household hygiene. References to a number of additional articles are here grouped together, particularly those which have to do with dust in relation to comfort and health, and with soaps and other materials.

Clean air and clean streets are generally recognized as important from the standpoint of comfort and health. Many studies have been made which show the relation of such matters to the general subject of hygiene.

The dust problem has been considered in a paper by D. Layritz (Die Staubplage und ihre Bekämpfung. Munich, 1908; rev. in *Arch. Volkswohlfahrt*, 2, 1909, No. 6, p. 396) in which he considers the dust nuisance and ways of lessening it, with reference particularly to street dust.

At the German Department of Public Health, R. Heise (*Arch. a. d. Kais. Ges.-A.*, 30, 1909, No. 1, p. 93; abs. in *Hyg. Rundschau*, 19, 1909, No. 23, p. 1365) studied 31 samples of materials recommended for the treatment of floors to prevent dust. The efficiency, cost, and other factors were taken into account as well as their composition.

A paper which is of interest in this connection is G. Orsi's (*Arch. Hyg.*, 68, 1908, No. 1, p. 10), which proposes a method for estimating quantitatively the amount of soot in air. His work was carried on at the Hygienic Institute of the University of Berlin under Rubner's direction. Orsi also studied the amount of dust in air and his investi-

gation contains much information regarding the character of dust, its effect on air, and the physical laws which govern the amount by air currents.

Dust almost inevitably implies bacteria associated with it. A new method for the bacteriological study of air is described by M. Ficker (*Arch. Hyg.*, 69, 1909, No. 1, p. 48), of the Hygienic Institute of the University of Berlin. Such work as this should be known to students of ventilation, as it is obvious that the whole question of ventilation must depend upon knowledge and not upon theory.

The injury which may result from the use of cosmetics and similar materials is a subject in which the teacher may have occasion to speak, and it is interesting to know that such materials are quite commonly analyzed in connection with pure food and drug work, so that reliable information is available regarding their composition and properties. As an example of such work may be cited Lürig's and Sartori's study (*Jahrb. Chem. Untersuch. Amt. Breslau*, 1908-9, p. 58; abs. in *Ztschr. Untersuch. Nahr. u. Genussmitl.*, 19, 1910, No. 8, p. 460) of the composition of hair dyes.

Pupils commonly receive instruction regarding the hygiene of the body, but it is not always easy to supply the scientific data which should be the foundation of such teaching. It is an easy matter to speak of the cleaning and disinfecting processes of soaps, mouth washes, etc., but much less easy to supply the chemical data which such subjects involve. The disinfecting action of ordinary tooth and mouth washes has been studied by R. Basseuge (*Deut. Med. Wchnschr.*, 35, 1909, No. 33, p. 1436; abs. in *Chem. Abs.*, 3, 1909, No. 22, p. 2711), and it is interesting to know that only two of the commercial products examined showed any bactericidal action.

CONCLUSION.

It would have been possible to extend greatly the list of references to papers similar in character to those included in the above summary, but the object was rather to make a preliminary survey of recent literature than to compile an exhaustive summary of data. It is hoped that libraries in colleges and schools will find it possible to increase their list of journals which are probable sources of information pertaining to domestic art topics and that systematic attempts may be made to abstract such literature. If a special section devoted to such subjects could be included in some one of the standard abstract journals, it would serve a very useful purpose.

A LESSON IN HOUSE CONSTRUCTION FOR THE ELEMENTARY GRADES.¹

ETHEL FIFIELD BROOKS, A.B., S.B.

Architect.

Young as you are, I want you to think now nice it would be to build a house some day, and if you learn a little about it now you can be noticing how houses are being built as you pass them in your walks. We are going to take for granted that this house will be in the country or edge of town and that it will stand by itself with the light and air coming to it on all sides. This way of living will make your family so much more healthy and happy that it is worth planning for and giving up other things for all these years that you are growing up.

If we are so fortunate as to be able to build a house for ourselves, we must first ask how can a house be so built that it will be our very good friend and keep us always in good health, so far as a house can—and it can do a great deal more for us in that way than most of us realize. Can it give us, if we build it rightly, that which we need most of all to make us strong and well, sunshine and fresh air, and a great deal of both? And what can it refuse to give our enemies, the disease germs, that are always ready to attack us when we are not in the best of health? a dark, damp spot where they may grow and multiply.

So we see that our house must be sunny and airy and dry, and when we go out to choose a place on which to build it we must have those three things in mind.

Now, as to sunshine. If there are trees on the vacant lot which we look at which will shade our house too much we can have them cut down, so we will not refuse to buy the land for that reason; but if there are houses too near, or a hill which shuts off the sun, we can do nothing with them, so we will not buy, but look farther on.

As to fresh air, we shall use our eyes very sharply for anything that will send us bad air to breathe, a factory, perhaps, or a tall apart-

¹ Presented at the Boston Meeting of the Household Arts Section of the American Home Economics Association, July 5-6, 1910.

ment house, that will shut off our fresh air. We must be careful, too, to choose a spot that is sheltered from the wind that blows dust and germs into our noses, and into our mouths, too, if we do not keep them shut.

If we have found a sunny, airy place to build our house, we must next see whether it will be dry enough. You know there is a great deal of water in the earth; there may be hidden springs, and there is besides the water that falls from the sky. Some kinds of soil will keep the water in them, and some kinds will let it drain away. So we have borings made into the earth to find just what the soil is. If it is gravel, that is very good indeed, for gravel will let the moisture drain easily through it; sand is nearly as good as gravel, and loam is next best; rock is good but expensive, as it must be blasted away to make a cellar. If we find that the soil is clay we shall probably build our house in another place, for clay is very bad indeed to build upon; when clay gets wet it stays wet for a long time—you know what happens when you step in a mud-puddle: The mud gives way in every direction and lets your foot down with a splash. It is the same thing that happens on a large scale if we put a foundation-wall on a clay bank: The rain comes, the clay soaks it up, and splash! the clay skips away from under our wall and down comes the house. So we will not buy land that we find to be clay, neither will we buy what is called "made land;" as somebody in *The Chippendales* said, it may be made of "gravel, tomato-cans and old hoop-skirts;" it may be made of decayed garbage, too, and other things too unpleasant to think about: so we will not buy "made land."

While we have been hunting, however, we will suppose that we have found just the piece of land that we do want to buy, so we go to our architect and tell him exactly what kind of house we want. It must be a house that shall be sunny, airy and dry, as well as beautiful, and so planned as not to waste our time and energy by making us take more steps than necessary in doing the house-work. We tell him that we want our windows large enough to let in plenty of sunshine, and high enough to let out the hot, bad air that rises to the top of the rooms; the greater distance there is between the ceiling and the top of the windows, the more bad air will stay in the room, but if the window be high, and open at the top, all or nearly all of the bad air will escape. We tell the architect, too, to make all ceilings at least nine feet high, to give us good ventilation, and to allow at least 1000 cubic feet of air for each person who occupies a bed-room. That is,

if one person sleeps in a room, the room must be, say, ten feet long, ten wide and ten high; if two are to sleep there, the room must be twice as large. We shall also have in our house fireplaces and ventilating-flues to give us fresh air, and it is likely that we may have to insist upon some, if not all, of these points, for many people do not think of them when they build a house, and an architect may not understand that we want them if we do not insist pretty strongly.

In order to be sure of getting sunlight into every room in the house at some time of day, we can find in the Nautical Almanac the exact point of the compass where the sun rises and sets on the shortest as well as the longest day of the year; and after our house is planned it will be well to make a "sun-plan," too, for if we find that the sun does not between its rising and setting shine on one side of the house, as it had been arranged to stand, parallel to the street, by setting the house at a little different angle we can catch the sunshine on all sides.

When the architect has satisfied us with the plans of the house we will go on with its building. Our house as planned is not only to be healthful, but beautiful also, for many of us do not realize what a difference it makes to us if we have beautiful surroundings in our daily life. And supposing that our architect has made the house all that we wish it to be on paper, we have next to see that it is so built as to be what we wish it in reality, and as the first of its building is the most important, that is the part that we will watch most closely; for if our foundation-walls and cellar are not dry, neither can the house itself be dry; if foundation and cellar-floor are not damp-proof the dampness will creep through into the cellar, and as the cellar-air rises through the house, the air in the house can be little better than that in the cellar; while if the foundation-walls become damp, the walls of the house will be damp, too, as the moisture rises. So we make our walls as nearly damp-proof as we can, with a coating of asphalt on the outside to keep out moisture and a layer of slate or asphalt or water-proof paper in the wall itself to keep the dampness from rising into the walls of the house. We make our cellar-floor damp-proof by layers of concrete, asphalt and again concrete. It may be that we have found the soil to be full of moisture, and in that case before building either walls or floor we have first laid lines of tile drain-pipe to carry the moisture away, and even in a good soil we provide for carrying moisture away from outside the foundation-walls by having a ditch dug around them and a little deeper than they are, with drain-pipe at the bottom filled in with

broken stone, gravel and sand; this will carry away the ground-moisture and the rain-fall from the foundation-walls.

When the foundation is built, the walls of the house go up next, and these are of such material as suits our taste and our pocket-book. They may be brick, stone, concrete or wood. If we can afford it, we have our house built of fireproof material entirely, if not we see to it that the hollow places in walls and ceilings are so stopped that fire may not steal unseen from one story to another. And, by the way, these hollow spaces, containing air and acting as non-conductors, are a very good protection against heat in summer and cold in winter, besides keeping the house dryer than would a solid wall.

When it comes to plumbing, we can only say that we must have the best—it may be simple, in fact it must be simple. The material must be of the very best, and put up by the best plumber we know, and especially we must insist that every fixture, every sink and wash-tub and basin, every bath-tub and every water-closet shall have a separate trap to prevent the foul air from sewer and waste-pipes from rising into the house.

These are the main things we have to think about when building a house. If we are buying instead we try to find a house that is as nearly as possible like the one we would build if we could. We try to find one that is airy and dry and sunny in every room, with no porch-roofs to shut out all the sunshine from a room (a summer awning is better), and with a dry, sweet cellar. If the house suits us, we have the plumbing tested to see if the pipes are quite tight.

If we are looking for a boarding-place we choose a sunny room, we look into the kitchen to see if it is sunny, airy and clean, we go into the cellar to find out whether it is dry or not, and we sniff vigorously in the toilet-rooms to test the plumbing as much as the sense of smell can do it. For if there is a bad smell in the house, there must be a cause for it; if we can remove that cause, all well and good, if not, the quicker we get out the better for us. There is no friend more useful than a sensitive and well-trained nose. The railroads have a sign on grade-crossings, "Stop, look, listen." When we approach a crossing we act accordingly. Now, we can make a similar watchword for ourselves in choosing a living-place: is the cellar dry? are the traps in proper condition? is there a crack in a waste-pipe, a gas-pipe or fixture that leaks?—Stop, look, smell!

It is a great responsibility to build a house. If we are choosing a boarding-place we have only ourselves to think of, but in building we

have to think of our families, our children and perhaps our childrens' children. No pains can be too great, no caution too minute. A house can be the best of friends or it can be the most dangerous enemy, because its dangers are unseen and unsuspected—and here is the especial argument against buying a house rather than building for oneself. Drainage, plumbing, foundations—how do we know what they are? If we find out at heavy cost—and we are lucky if the cost is only in money and not in health or even human life—it will call for further expense to make right what was wrong. Contractors are trying people to deal with, so are architects and plumbers, by reputation; but after all, what is a little annoyance if we are sure we are getting just what we want, and if we are sure that what we want is right for us to have? Remember, it is not only the house, it is the home! What house could be a happy home for our children if it were also a nursery for disease? But sunshine, fresh air, sweet odors, fine proportions—how better can we start our home?

THE APPLICATIONS OF CEMENT IN RESIDENCE CONSTRUCTION.

JAMES M. WHITE.

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Concrete and stucco are not new constructive materials, but they have come into general use so recently that the usual effects obtained with them may be more appropriately described as novel, rather than artistic. The constructive value of a material is far more quickly appreciated than its artistic possibilities, and though there is ample proof of the durability of concrete there are only occasional evidences of a true appreciation of the logical treatment for it and of the ways by which color effects may be successfully introduced.

An entire house may be built of concrete, but this article is to deal with outside walls only and they are usually built in one of the following ways: Monolithic concrete, which may be made either with or without an air space in the wall; monolithic concrete, with a hollow tile inside lining; monolithic concrete, with a hollow tile outside facing; concrete blocks; brick or hollow tile walls, with stucco exteriors; and frame buildings, with stucco exteriors, using either wood or metal lath.

The essentials of a perfect wall are strength, dryness and beauty. There is no doubt about concrete complying with the first of these requisites, but experience has proved that, unless employed very skillfully, neither concrete nor stucco will make a non-absorbent wall. In some climates protection need be provided only against dampness which comes from the ground, or from the exterior, while in other places—because of the high humidity which prevails during certain periods of the summer—it is necessary to construct a wall so that the interior surface will change in temperature almost as rapidly as the temperature of the room, to prevent the moisture of the atmosphere from condensing upon it.

A monolithic concrete wall, if mixed very wet, with one part of cement to six parts of sand and stone of suitable sizes, will be much more nearly waterproof than any other form of masonry construc-

tion. The same density of material cannot be secured with stucco, unless the surface is thoroughly troweled; but there is nothing artistic in a troweled finish and it should never be employed for residence walls above grade.

The advocates of cement exteriors for houses have laid great stress upon the economy of maintenance because of its being unnecessary to do any painting. This claim is justified in part, but my experience convinces me that painting at the outset is very essential to the proper preservation of most stucco surfaces, and that it is beneficial in all cases. Special cement paints should be used, and not the ordinary lead and oil; and it is not necessary to keep on painting as with wood surfaces.

Briefly summarized, the advantages and disadvantages of the different methods of construction are as follows: The monolithic concrete wall must receive some special treatment after the forms are removed. This may be very effectively done in several ways. The simplest method is to remove the forms as soon as possible and then to scrub the surface with a block of wood. This merely removes the form marks and makes the surface of a uniform texture, but does not give an artistic wall unless special precautions have been taken in choosing the materials which will appear on the surface when the fine particles of cement are removed.

With very little additional trouble a better effect can be obtained by the following method: As soon as it can be done without removing the coarser particles, the surface should be brushed with an ordinary scrubbing brush, with stiff palmetto fibers, or one with wire bristles. Two or three days after the brushing the surface should be washed down with a dilute acid solution, using one part of commercial muriatic acid to two or three parts of water. This solution may be applied with any kind of a brush, and while still wet, the surface should be thoroughly rubbed with a stiff vegetable fiber brush. The solution should not be allowed to remain upon the wall more than half an hour, and must be thoroughly washed off with clean water to avoid leaving a streaked or mottled appearance. If the surface cannot be treated until after it has become hard, a very effective finish can be obtained by pounding it all over with a stone mason's bush hammer. The effect shown in figure VI may be obtained by plastering the inside of the forms with clay and imbedding pebbles in it. After the forms are removed, the clay is easily washed off, leaving the pebbles fully exposed.

If the monolithic wall is made hollow, the inside plaster can be applied directly to the wall; but the concrete must be left quite rough or the plaster will not adhere firmly. The use of a hollow tile lining for walls is to be recommended, in which case the hollow tile is laid up against the inside of the forms, and the concrete poured in behind it, which binds the whole mass together. This makes a splendid wall construction. The exterior should be treated with acid or bush hammered, for stucco cannot be successfully applied to a smooth concrete surface.

The use of tile on the outside of the wall protects the concrete from the heat of the sun, and thereby maintains a more nearly uniform temperature on the interior, since the concrete wall changes temperature very slowly. The use of tile on the outside also gives an excellent opportunity for applying a stucco of any desired color or surface texture.

The concrete block walls have been more extensively used than any others, because the walls can be laid up the same as masonry walls. Good concrete blocks can be made, but they are the exception; and it is almost impossible to design a wall to be built of blocks which will have the necessary variety to make it attractive. The blocks are not readily changed in size, and a rigidity of design results which is usually extremely monotonous.

In many localities there is good clay but very little sand or stone. In such cases brick is a more economical building material for the body of the wall than concrete. The artistic effects of cement exteriors may be obtained in this case by applying stucco. If the wall is built hollow, or is to be furred on the inside, the stucco may be applied directly to the brick surfaces; but if the wall is solid, it is advisable to coat it both on the outside and inside with one of the waterproofing compounds made for the purpose, which will prevent moisture entering the wall from outside, and avoid the staining of the plaster inside, without interfering at all with its bonding to the wall. The objection to tile walls, which are to be built of but a single thickness of tile, is that it is difficult to fill the end joints with mortar. If more than one tile is used in the thickness of the wall, this objection is obviated. The waterproofing coatings can often be used to advantage on the inside of concrete walls to prevent plaster stains.

Stucco on frame construction has been more generally employed than any of the other forms of cement finish. With this construction it is very necessary to secure an impervious coating, because the

freezing and thawing of so thin a layer will destroy it; and the moisture will also corrode the metal lath, which is never fully imbedded in the cement. Even if lath is painted or galvanized, it will in time be rusted out. Wood lath, one inch wide, may be successfully used, if the nailings are not over twelve inches apart.

The "rough cast" finish, which resembles figures IV and V, is the most durable, because the finer particles of cement are washed over the surface by the excess of water, which gives much the same finish that would be secured by brushing it over with a cement wash. Too rapid drying will surely cause cracks; and walls should be frequently sprinkled until well hardened. Such a surface may be tested for porosity by throwing water against it and noting whether it changes color, which is a sure indication that the surface has absorbed some of the moisture. Painting is the only possible protection for such a surface.

The mission buildings of California have furnished many suggestions for the design of concrete buildings; but it is always unwise to transplant any style, without carefully considering its adaptability to existing climatic conditions. In the middle and eastern states where there are open winters, resulting in intermittent freezing and thawing, and frequent rain falls at all seasons of the year, it is unwise to ever employ outside stucco work without protecting it by a heavily overhanging roof.

Frame houses often have many constructive defects which result in the buckling and breaking off of the stucco coating. All lumber employed for building purposes is more or less unseasoned, and if the studdings in the outside walls are not continuous throughout the entire height of the building, there is apt to be enough shrinkage at the floor levels to cause the breaking of the stucco. In remodeling old frame houses, of course this difficulty would not occur; and the simplicity of the lines of many an old house would make it very effective in stucco. Even with new lumber much of the difficulty mentioned may be obviated by using a wood belt course at the floor level, so as to break the stucco surface, though this usually makes it desirable to employ a half-timber effect for the walls above that line. Such a treatment is almost always the most attractive, but great care is required to prevent the dampness getting behind the woodwork. Stained woodwork is much more effective with a cement exterior than painted woodwork, but the stain is not as efficient a preservative.

There are given herewith six photographic reproductions of brushed

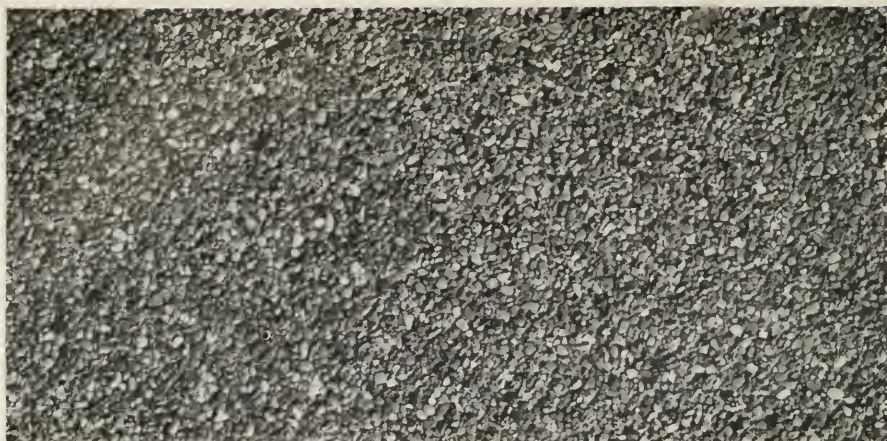


Figure I—Cement and fine sand 1 : 3.



Figure II—Cement and coarse sand 1 : 3.



Figure III—Cement and $\frac{1}{2}$ in. to $\frac{1}{2}$ in. pebbles 1 : 3
Surfaces reduced one-half of originals.

CEMENT MIXTURES.



Figure IV—Cement and red granite screenings 1 : 2 $\frac{1}{2}$.



Figure V—Cement and $\frac{1}{4}$ in. granite screenings 1 : 2 $\frac{1}{2}$.



Figure VI—Cement and black pebbles 1 : 2 $\frac{1}{2}$.

Reproductions are actual size.

CEMENT MIXTURES.

concrete surfaces produced in the laboratory of the Universal Portland Cement Company. The difference between these surfaces and that of ordinary gravel concrete is very striking, yet they are all practical, commercial finishes, and can be obtained by the use of material from an ordinary gravel bank. Figure I shows a comparatively fine, even-grained surface, composed of one part cement and three parts of fine sand, all of which passed a No. 8 and was retained upon a No. 50 mesh screen. Figure II is very much like Figure I in general appearance and color, but of a rougher, more uneven texture. This surface is a 1:3 mixture, with coarse sand, passing through a No. 4 and retained on a No. 8 screen. Figure III represents a finish made from a 1:3 mixture of cement, and from $\frac{1}{4}$ in. to $\frac{1}{2}$ in. pebbles. Thus these surfaces are identical in every respect, except as to size of aggregate. The three surface finishes were all produced by the same method of treatment.

Figure IV shows a decidedly pleasing, even-grained surface composed of one part cement and two and one-half parts red granite screenings, all of which passed a No. 8 and was retained on a No. 16 sieve. Figure V is a reproduction of a surface composed of one part cement to two and one-half parts ordinary, quarter-inch, granite screenings, the material passing a No. 8 sieve being rejected. Both these surfaces are quite similar in every respect except in texture, that represented by Figure V being of a rougher, coarser grained texture than the other. As the cement is barely perceptible on these surfaces both look very much like rough, undressed red granite, the color being practically the same as that of the screenings of which they were made. Figure VI represents a treated surface composed of one part cement to two and one-half parts of black pebbles, varying in size from those retained on a No. 10 sieve to those passing a $1\frac{1}{4}$ inch mesh. The cut gives but a poor idea of the pleasing contrast between the light colored cement background and the black pebbles which stand out in bold relief from the surface.

There is no doubt but that cement architecture has come to stay; but there is still much to be learned about the limitations of the material and the importance of extreme care in the workmanship.

EDITORIALS.

The city of Baltimore with its good record for holding the first Tuberculosis Conference and Exhibit in this country and the first conference and exhibit in the interest of clean milk has to its credit the initiation of another important movement. From November 9-11 was held in that city the first conference for the Study and Prevention of Infant Mortality.

The Meeting of the American Association for Study and Prevention of Infant Mortality.

It was a notable occasion, addresses being delivered by many well recognized authorities on hygiene and pediatrics and by younger men and women whose work in these lines will be no less well known in the future. A remarkably well chosen and well mounted exhibit in the corridors of McCoy Hall of the Johns Hopkins University was open to the public for a week and it enforced by ocular demonstration the statements made by the lecturers.

That it is high time to start a crusade of this kind was evidenced by the startling character of the statistics brought out: That out of 100 children born alive 13 die; that the mortality for all ages from tuberculosis of the lungs is 50 per cent less than the mortality from all causes among infants; that of the 300,000 children who die yearly in this country fully one-half or 150,000 need not die; these being moderate estimates drawn from a restricted area, since statistics of birth are shamefully neglected in most of our municipalities.

Who is to solve this great problem? In the words of Dr. Wilbur C. Phillips, secretary of the New York Milk Commission,

In the last analysis, infant mortality is to be solved, not by philanthropy or by institutions, or by the medical profession, or by the state, but by intelligent motherhood.

And around the present and future motherhood of the country a cordon, as it were, is to be drawn; the doctor, the nurse, the milk depot, the hospital, the school, the visiting dietitian are all uniting to train the girl and the young mother and to follow the infant through every week of its early life. The time has evidently gone by for

parents to assume that the rearing of their children belongs exclusively to them. If they do not know their business, or knowing, do not perform it, the community must step in. It has too much at stake; these infants are to be citizens, either able to carry their share of the burdens or to be a dead weight upon the able bodied.

Throughout the meetings there was evident what might be called a feeling of insurgency, of revolt, against the meager share now given in systems of education to all that makes for the conservation of life and health and the development of efficiency in the individual. It was charged that medical schools give insufficient time to training in preventive medicine and hygiene and to pediatrics, the study of infant life; also that instruction in normal schools is far behind modern requirements, "ninety-three per cent of their questions in physiology and hygiene being in anatomy and less than 7 per cent on healthful living."

During the conference the importance of breast feeding in reducing infant mortality, the urgent need of uniform state laws for compelling birth registration, the necessary courses of instruction for all ages and both sexes, were all dwelt on in the most convincing manner.

Among the most encouraging reports of a new activity in the teaching of hygiene were those made at the session for education in which Home Economics played a large part. This section was in charge of Dr. Helen C. Putnam, and addresses were made by women whose names are very familiar to our readers, as Prof. Abby L. Marlatt of the University of Wisconsin and Prof. Flora Rose of Cornell University.

The aims of the new association are of special interest to the readers of this JOURNAL. To keep alive the babies, and to rear them to effective citizenship—is not this one of the chief ends for which the home exists?

With this number ends the second volume of THE JOURNAL OF HOME ECONOMICS. Being a baby has recently been classed among the extra hazardous occupations, and the friends of this new movement may be devoutly thankful that the various diseases that lie in wait for infancy have not carried off this promising offspring of our Association. Its heredity being of the best, its constitution has proved vigorous, and means for its development have been generously furnished by its sponsors. Those of us appointed to watch

over it have received some useful training at the expense of the Association and the account of our stewardship will be presented at the annual meeting, but to that larger audience which is made up of the readers of the JOURNAL we wish to present the following statements.

The correspondence that has come in from our widely scattered members has shown that the idea of the Association has taken firm root. It has become a name to conjure with; it stands for a union of like-minded people joined together to further the interests and raise the standards of the home, and they have found themselves able to do together what is impossible to the individual.

To foster this spirit of loyalty to the Association has been our main object. To this end we have placed the emphasis not on subscriptions to the JOURNAL but on membership in the Association, the JOURNAL being one of the privileges of membership, for we have felt sure that a firmly knit association devoted to noble ends would be of untold good to its members and to the community.

We hope that this loyalty to the Association will be unaffected by the slight changes in its relation to the JOURNAL which are now made necessary by regulations recently put in force by the Post-Office Department, among which is the requirement that the subscription list to a periodical which carries advertisements must be separate and distinct from the membership of an Association.

A full account of this new arrangement was set forth in the extra slip bound in with the November issue, and subscriptions to the *Journal* for 1911 were asked for in accordance with the prescribed form. This appeal has met with a generous response but we find it necessary to reprint it with this issue that it may meet the eye of any who failed to see it before.

The price of membership has been placed at a nominal figure, 25 cents, with the view of putting no hindrance in the way of building up a large organization. If the 1500 members now on our lists all pay this fee the sum realized will defray the expenses of the annual meeting, printing of necessary notices, etc. To increase our membership and to bring new subscribers to the JOURNAL should be a work dear to the heart of every one of us.

Please note that the JOURNAL cannot be mailed to anyone who is in arrears for subscription. Note also that the price of single copies has been raised to fifty cents.

NOTICES.

Members will please note that the title page and index for Volume II, 1910, are added to this number. Also that the title page for Volume I, 1909, has now been printed separately and will be mailed to all who request it for binding.

Title Page and Index.

The editors repeat their request for Nos. I and II of Volume I and No. I of Volume II. Forty cents will be paid for each number in cash or in credit on subscription.

Back Numbers.

In ordering reprints members will please consult the cover page of the latest issue, as changes and additions are frequently made.

Reprints.

The convention of the American Home Economics Association will be held in Teachers College, St. Louis, December 27-30. The annual meeting will be on Thursday, December 29, at 1.30 p.m. The provisional program has been sent to all members and the final program, which will be printed just before the Convention meets, will be sent to all requesting it.

Convention and Annual Meeting.

BENJAMIN R. ANDREWS, *Secretary*,

525 West 120th St., New York City.

November 30, 1910.

NEWS FROM THE FIELD.

The department of household science reports an increased enrollment. In Miss Bevier's course on The House, alone, there are 118 students, representing eleven states.

The 1910 high school conference was held at the university November 17-19th, with the following topics: What can the course in elementary science do for the domestic science teacher? Possibilities in chemistry being discussed by A. C. Norris, of the Rockford High School, and those in physiology and bacteriology by Mr. Bonnell, of the Harrisburg High School; household science as related to other work in the university, by Professor Hollister, high school visitor of the university; examples of art needed in the teaching of clothing and the home, by G. A. Eggers, Chicago Normal School; under the general subject of clothing, what to teach the high school girl and when to teach it, by Miss Peterson, Peoria High School; how to teach it, by Mrs. Helen Brooks, Illinois Normal University; and clothing and hygiene by Mildred Wiegley, DeKalb High School; and practical lessons to improve the sanitary artistic and economic conditions of the homes, the sanitary aspects being considered by Miss Edith Hall, DeKalb Normal School, the artistic side by Miss Melissa Wilson, New Trier High School, Kenilworth, and the economic phases by Miss Margaret Culberston of Hinsdale.

The conference grows in interest and importance each year. The fruit of the work of the high school assistant is seen in the rapid increase of the number of schools offering household science, there now being 71 as against 21 three years since. The committee in charge of the syllabus for the high school work, which serves to unify and in a measure standardize this instruction, has completed a revision of the syllabus which was discussed at the meeting.

In connection with the college of agriculture the household science department is establishing movable schools, in which two representatives of the department work for a week, giving demonstrations and lectures on food, clothing and the home.

Some further results of Dr. Goldthwaite's research work on jelly appeared in the November number of the *Journal of Engineering and Industrial Chemistry*. The department is also publishing a series of five bulletins by which the results of investigations of the department will be made available to the housekeepers of the state.

The school of household arts opened for the academic year with a much larger registration than that of the preceding year. Last year there were approximately, 260 college students in the school, candidates for diplomas and degrees, 77 taking domestic art; domestic science, 152; hospital economics, 17; household administration, 15, and house decoration, 1. On October 5, 1910, there were already registered some 335 students, divided as follows: Domestic art, 59; domestic science, 223; nursing and health, 25; household administration and dietetics, 17; and house decoration, 11. The registration has subsequently increased in all the divisions.

In addition to the regular students registered in the school last year, there were in the "special classes" in household arts some 400 students who came for one or more days a week for the practical classes in cooking, design decoration and management. The special class registration for the current year is not yet complete but there is the prospect of increased registration in these classes as well as in the regular college work.

An interesting factor this year is the registration of a group of high school graduates for the applied arts diploma. The group already numbers some 25. Though classified along with the non-matriculated students of the college they form an important group, since they are planning for a definite two-year curriculum of study, at the end of which many of them will doubtless transfer into the curricula leading to the professional diplomas in teaching, administration, and decoration.

The experiment of a Journal Club is being tried this year. The plan is to have a student organization, the members of which bring in abstracts of magazine articles and reviews of new books. The club meets once a month and promises to be of help to the students. Occasional lectures are to be a feature.

Another series of meetings which has been found useful is the monthly lecture by visiting speakers upon opportunities for work in the newer branches of household arts work. Addresses upon trade schools, journalism, extension work and other newer forms of activity were included in last year's series of addresses. Lectures are being repeated this year with the additional provision, during the second half-year, of a series of informal addresses by members of the faculty upon new subject-matter in the field of household arts instruction. In these addresses recent progress in nutrition, textiles, decoration and other divisions of the field will be presented.

The number of girls enrolled in the department of Home Economics of the college of agriculture of the university is more than double that of last year. Over 100 young women are taking the four years' and graduate courses. A large number of students in the college of letters and science, candidates for the bachelor of arts degree, have also elected the general survey of Home Economics and the art and design studies, open to students in that college. In the latter subject one class includes over 100 young women. Most of those who have entered this year have had good preparation and are in position to receive the maximum benefits from the instruction.

Miss Edna Miller, of Montrose, Pa., a 1910 graduate in domestic science at Pratt Institute, has been made director of domestic science and arts of the Y. W. C. A. of Scranton. Miss Miller is holding a cooking class every night, and on one afternoon in the week a sewing class for children which she conducts in a novel way. From 3-4 p.m. she teaches a class of volunteer teachers and from 4-5 p.m. these teachers teach the children under her direction. The first day 65 children appeared, and it is hoped to have 100.

According to a recent note in *Nature*, the governing body of the Battersea (England) Polytechnic is arranging for considerable development in the work of the domestic economy department. An entirely new third-year course will be introduced, which is expected to carry forward greatly the application of science to housecraft. It will consist, in the main, of much more elaborate work both on the theoretical and practical sides in the subjects of physiology, hygiene, chemistry, physics, and biology. Special attention is to be given to the scientific side of the processes which underlie the arts of cookery, laundrywork, and housewifery. It is also intended that students shall spend some of their time in practical research work upon the various biological and chemical processes in which so much of their work will be done.

Miss Alice Ravenhill, author of the invaluable study of the American institutions teaching domestic science which appeared in special reports of the English Board of Education some years ago, and known as the leader of the Home Economics movement in England, is retiring from active educational work and will make her home for the future in British Columbia. Miss Ravenhill's many American friends will be glad to have her new address: Chrachveattle, Shawnigan Lake, P. O., Vancouver Island, B. C., Canada.

This branch was organized in Boston, in December, 1909, but will hold its first meeting Dec. 28, in connection with the state teachers' association at Rochester. A largely attended meeting is hoped for. There is a membership fee of twenty-five cents, of which fifteen cents may be retained by local branches for their work. Such a branch was formed at Rochester last June, with local officers, and branches may be formed in other parts of the state, with the coöperation of the state officers if desired.

The first annual meeting took place at Dayton, November 11. The program included an address by President W. O. Thompson of Ohio State University on The Place of Domestic Science in Secondary and College Education; a luncheon at the Stivers Manual Training High School, and a round table led by Miss Rachel Hartshorn Colwell. Among the topics discussed were The Use of Drafting in High Schools, by Miss Lana Bishop, Technical High School, Cleveland; the Relation of Domestic Art in the Elementary Schools to that in the High School; and Plans for School Kitchens and Materials for Tops of Tables, by Miss Ruth A. Wardall, Domestic Science Department, Ohio State University, and Miss Uhrick, Supervisor of Household Arts, Cincinnati.

The Wisconsin branch was formed at Milwaukee, Wis., at the meeting of the Wisconsin State Teachers' Association last year, with Miss Emma Conley, School of Agriculture, Wausau, Chairman, and Miss Abby L. Marlatt of the University of Wisconsin, Mrs. Bertha Johnston, director of domestic sciences, Oskosh, and Miss A. Bischoff, director of domestic science, Ashland, as members of the executive committee. The first annual meeting was held at Milwaukee, Nov., 5 1910,

in conjunction with the domestic science section of the state teachers' association. Miss Mary S. Snow, director of household arts, Chicago, gave a paper on the Training of Girls for Efficiency. Miss Marlatt led a round table discussion on the aim and purpose of the branch association.

In several large cities women's clubs are arranging for courses of popular lectures on Home Economics subjects. Much of this interest has been aroused during the past two years by the efficient work of Mrs. Olaf B. Guldlin, of Fort Wayne, Indiana, the chairman of the Home Economics Committee of the General Federation of Women's Clubs. It has proved a wise policy to hold her in that office for a second term instead of starting with a wholly new committee as has been the plan heretofore. The new committee in full consists of Mrs. Guldlin, chairman; Miss Mary F. Rausch, State Agr. College, Fort Collins, Col., vice-chairman, Miss Caroline L. Hunt, Madison, Wis.; Miss Martha Van Rensselaer, Agr. College, Ithaca, New York; Miss Anna Barrows, Teachers College, New York City; Mrs. Chas. P. Weaver, Louisville, Ky.; Mrs. Cree T. Work, Denton, Texas; Mrs. H. M. Pancoast, Palmyra, N. J.; Mrs. C. R. Wyatt, Huntington, W. Va.; and Mrs. Ray Ruchton, Montgomery, Ala.

Home Economics had an important place in the program of the recent Indiana State Federation meeting. Mrs. Virginia C. Meredith, who has been for so long identified with the work, presided at this session. The Field and Its Possibilities was very enthusiastically presented by Mrs. Guldlin, and a plea for a closer relation between the work in the home and Home Economics in the school was made by Miss Isabel Bevier of the University of Illinois, under the title Home Economics and The Home.

There is an increasing demand for simple practical talks and demonstration lectures on household topics before farmers' institutes. North Dakota, Iowa and

West Virginia are arranging for special work of this type, and several other states will send household economics workers with their agricultural trains. Miss Abby L. Marlatt is arranging a full program for the short course in Home Economics at the University of Wisconsin.

The New England Corn Exposition, held at Worcester, Mass., November 7th-12th, recognized its connection with Home Economics by introducing several lectures on Corn as Human Food.

The Brooklyn Institute of Arts and Sciences in its prospectus for 1910-1911 announces two courses of lectures on domestic science on the following topics: November 10, All Sorts and Conditions of Kitchens; November 17, The Grocery Bill; December 1, Food for a Day; December 8, Food for the Growing Child; December 15, Dinner; December 22, Milk and Eggs; January 6, The Fireless Cooker and its Use; January 13, How to Use the Casserole; January 20, Electrical Cooking Devices; January 27, Milk, Butter and Cheese; and February 3, Modern Labor-Saving Devices. All of these lectures are to be illustrated by cookery or with lantern slides.

The third annual conference of the Philadelphia League of Home and School Associations occurred October 27-29, 1910, the sessions being held at the office of the superintendent of schools, the William Penn High School, and the New Century Club.

Philadelphia League of Home and School Associations. At the afternoon session on October 28 the topics discussed were: What the City Owes the Child, What the Citizen Owes the Child, and What the Child Owes the City, the speakers being Hon. John E. Reyburn, Mayor of Philadelphia, Miss Marion Reilly, Dean of Bryn Mawr College, and Rabbi Joseph Krauskopf, President Patriotic Society of Philadelphia. The subject under consideration at the morning session, October 29, was Home, School, and the Budget, the speakers being Miss Pattie S. Hill, Teachers College, as to the home; Superintendent John W. Carr, of Bayonne, N. J., and Hon. O. T. Carson, of Columbus, Ohio, as to the school; Mrs. Louise Stevens Bryant, Russell Sage Foundation, New York City, as to luncheons, and Dr. William H. Allen, Bureau of Municipal Research, New York City, as to the city's budget. At the afternoon session reports of the association were presented, and also a report by Mrs. J. Scott Anderson, delegate from the Home and School League, on the International Congress of Home Education held at Brussels, Belgium, August, 1910.

It is interesting to note in this connection that the school luncheon work under Miss Emma Smedley's supervision is being very rapidly extended in the city.

The interests of German housewifery are about to be furthered by a German Household Association, organized on a basis similar to that of the German Agricultural Society. This association purposes to include within the scope of its activities all matters relating to domestic economy, not only the hygienic and technical phases, but the educational, national, and ethical aspects of the subject. As announced in the prospectus, some special matters for consideration are as follows: Schools for mistresses, maids, cooks and housekeepers; instruction in cookery and housewifery in boarding schools, high schools, training schools, etc.; training courses for domestic science teachers; instruction in housewifery in the home; Home Economics conferences; household accounts—the relation of income to expenditure, etc.; and experiment stations for the testing of household supplies, implements and machines.

Various means to be employed by the association to further its aims include the establishment of a correspondence department, composed of competent judges and experts, to which all pertinent questions may be referred; a publication department, for the publication of a household year book, and the maintenance of housewifery departments in newspapers and magazines; the establishment of depots for the testing of household supplies in the interests of pure food, and of household implements, to promote domestic efficiency through a knowledge of labor-saving machinery; and the exhibition in international expositions, museums, schools and elsewhere, of approved machinery in operation, tested household necessities, and all other phases of housewifery which may be of educational value.—ELLEN BEERS, Teachers College

This exhibit, which has been postponed till January, 1911, is being organized in a very comprehensive way. Committees have been appointed on homes, streets, schools, recreation and amusement, printed matter, industry, religious influences, settlement associations, public and private charities, and laws and administration. These committees will have in mind the effect of the respective forces on the health of the child, his mental development, his vocational adjustment, his recreational life, civic responsibilities, domestic and parental efficiency, character, and spiritual development. The exhibit will be made as graphic as possible by actual models, photographs, pictures, pictorial diagrams, cartoons, epigrams, etc., in addition to statistical tables, diagrams, charts and maps.

Readers of the JOURNAL will be especially interested in the plans of the committee on homes. Under the general head of housing and home life, there will be arranged an investigation and exhibit of about seven representative blocks, typical of differences in congestion of population, economic status, social condition and nationality. There will also be a constructive and contributory exhibit of models illustrating urban and rural possibilities in housing, models as to house furnishings, clothing for children, toys, sanitation, infant mortality, and the food and feeding of children. Under this last heading there will be presented typical menus, suggestions as to dietaries, comparative food values, school children's luncheons, the milk supply and the care of milk in the home, the ice supply in relation to the small consumer, and the inspection of bakeries, water tanks, drinking fountains, candy manufacture, soda fountains, and push-cart lunches and candies. There is also a section on home training, which includes a survey of present opportunities in New York City in public and private schools, settlements, societies, vocational schools, etc., the courses offered in cooking, needlecraft, bacteriology, biology, hygiene, household management, household art, child study and training, family and social life, etc., and suggestions for additional work along these lines.

In conjunction with the exhibit, the Home Economics Association of Greater New York will hold a meeting at which Dr. Lafayette B. Mendel, of the Sheffield Scientific School, will give an address on some phases of nutrition during growth.

A conference on the School Lunch Problem was held in Boston, Saturday, December 3, 1910. Among the speakers were Mrs. Ellen H. Richards, Miss Caroline L. Hunt, Dr. Thomas F. Harrington, Dr. George S. C. Badger, Mr. Robert A. Woods and Miss Sarah Louise Arnold.

At the celebration of the 25th anniversary of the founding of Smith College, Mrs. Ellen H. Richards, president of the American Home Economics Association, was honored with the degree of Bachelor of Science.

BOOKS AND LITERATURE.

Household Foes for Boys and Girls. Alice Ravenhill. (With a hundred illustrations by Agnes M. Kelley.) Sidgwick and Jackson, London, 1910. 359 pages.

This book by the leader of the Home Economics movement in England is intended "to arouse the interest of young people in the practice of daily domestic cleanliness and to furnish them with reasons, adapted to the comprehension of boys and girls, for the demands thus made upon their perseverance and energy." The book is written in the form of a story of the experiences of two children, who, with their mother, visit a dilapidated house and institute measures to set it in order. It endeavors to bring home the lessons of sanitation and cleanness upon a level of explanation intelligible to boys and girls. In each chapter there are references to literature, Miss Ravenhill's *Practical Hygiene* in particular, and other books as well.

An elementary school supervisor has examined the book and reports that like most works of this sort which attempt to be didactic the style is not entertaining, and that the children seem to know more of science than could be expected of the American child, at least. One would like to see the book tried out in a school room, however, before accepting the fairness of this criticism. The information which the book gives, the stimulus which it would afford to the forming of good habits, cannot be gainsaid. The illustrations are many of them wonderfully suited to their purpose and probably upon children would leave even a more lasting impression than the text.

A word should be said as to the type of book which this volume represents. It might well be considered a "supplementary reader," as the term is used in American schools. There is a great need to-day for suitable reading books on Home Economics for the use of young people. We are not sure but that Miss Ravenhill's *Household Foes* could be used with great advantage in American schools despite its constant references to English conditions. We hope it may inspire similar American books.
—B. R. ANDREWS.

The Health of the City. Hollis Godfrey. Houghton Mifflin Company, Boston, 1910. Pp. 371. Price \$1.25.

This is a popular and very interesting presentation of the problems of public sanitation. The chapters are devoted to the following: Air, the milk supply, the city's food, the food of the individual, city water and city waste, ice, sewer gas and plumbing, the city's noise, city housing abroad, and city housing in America. There follows a selected bibliography. The material presented in this volume first appeared in abbreviated form in the *Atlantic Monthly*, where it found many interested readers.

The Woman who Spends. Bertha J. Richardson. Whitcomb and Barrows, Boston. Pp. 161. \$1.00 net.

This second edition of *The Woman Who Spends* is not a reprinting but a revision, and it is receiving a cordial welcome, we are told by the publishers, as a general statement of the economic function of woman as a house manager. The new edition contains a chapter on household accounts. This is a general statement of their importance and makes the new point that household accounts are worth while even if they are not absolutely correct, since, if they cover three-quarters or five-sixths of the whole expenditure they furnish something of a guide in household expenditure.

Choosing a Vocation. Frank Parsons. Houghton Mifflin Company, Boston, 1909. Pp. 165. \$1.00.

The choice of a vocation is related to Home Economics, since the home is often the deciding influence in the choice of a trade or calling, and since the profession chosen is so closely related to the later income of the individual upon which the stability and success of the family often depend. Here, now, is the first attempt to place choice of vocation upon a solid basis of thorough self-examination by the individual, complete classified knowledge of the facts of different vocations, and expert assistance from trained vocation counselors. The author was the founder of the recently established Vocation Bureau in Boston, and also developed a professional method of work for the vocation counselor (which this book presents), and established a School for Vocation Counselors in Boston. This movement to aid young people in choosing a trade or calling is getting a foothold in the public schools, as in the Vocation Bureau of the New York City schools. See, also, an article on Vocation Teaching by W. T. Miller, in the *Atlantic Monthly* for November, 1909 (pp. 644-6).

Industrial History of the United States. Katherine Coman. Macmillan Company, 1910. Pp. 461. \$1.60.

This is a new edition of this standard work by the professor of economics and sociology in Wellesley College. It will be of interest in all college departments of Home Economics as a standard textbook and reference work. To those who do not already know, it may be interesting to state that the general scheme of the book includes treatment of the following topics: The land and the people, the business aspects of colonization, industrial development under British control, industrial aspects of the revolution, national beginnings, industrial consequences of the War of 1812, the epoch of expansion and the crisis of 1837, territorial expansion and the revenue tariffs, the Civil War—economic causes and results, contemporary problems, and conservation.

The book contains 77 illustrations, including half-tones and maps.

Progress in Agricultural Education Extension. John Hamilton. U. S. Department of Agriculture, Office of Experiment Stations, Circular 98, pp. 12.

This report by Professor Hamilton, the Farmers' Institute specialist of the Office of Experiment Stations, will be found of a great deal of value to all interested in collegiate departments of Home Economics. The agricultural colleges have already done considerable work in Home Economics, references to which are made in this pamphlet, but it will be especially helpful in its statement of extension work in

agriculture. It is evident that useful extension work in Home Economics must follow along much the same lines.

National Education Association. Report of the Committee on The Place of Industries in Public Education to the National Council of Education, July, 1910. Published by the Association, 1910. Pp. 123.

This is the latest summary of the vocational education situation. It includes the report of sub-committees on industries in the elementary schools, intermediate schools, industrial and technical education in the secondary school and a selected bibliography on industrial education.

Annual Report of the Inspector of Technical Education, 1909. Printed by the Order of the Legislative Assembly of Ontario. Toronto, 1910.

This report, drawn up by Mr. Leake, is very rich in illustrations, both of industrial arts and of household arts. It will be of interest to classes in methods of teaching the household arts.

Bibliography of Household Arts.

A bibliography of selected reference books in the field of household arts is to be published by the School of Household Arts, Teachers College, about the first of December. It will be made available for general use at a small price covering the cost of printing. This is in line with the policy of the school to print a series of small pamphlets to include subject-matter which needs to be made available for the use of students. The first publication of this sort was Dr. Devine's paper, *The Economic Function of Woman*, which was reprinted in October, and which is available for use in other institutions at ten cents a copy, with a discount in quantities.

"Euthenics." *The Science of Controllable Environment. A Plea for Better Living Conditions as a First Step Toward Higher Human Efficiency.* Ellen H. Richards. Whitcomb and Barrows, Boston, 1910. 162 pages.

This, the latest of Mrs. Richards' books, presents a philosophy of the Home Economics movement. Many members of our Association will recall that "Euthenics" is a term born of the meetings at Lake Placid. "Eugenics deals with race improvement through heredity." "Euthenics deals with race improvement through environment." "Euthenics is hygiene for the present generation."

For many years, Mrs. Richards has been one of the leaders in American work in hygiene in the field, especially, of safeguarding water supplies and establishing pure food standards. A volume is just coming from the press which brings to a focus her purely scientific work in these fields of chemical research and instruction. Along with her work as a chemist, however, has gone her interest in the improvement of the American home. One recalls her long list of books, among others, "The Art of Right Living," "The Cost of Living," "The Cost of Food," "The Cost of Shelter," "The Cost of Cleanness." Now comes this volume on "Euthenics" which relates in a definite way the activities known to us as "Home Economics," to the general movement for the conservation of life and health, and to the scientific movement of the last quarter-century which has endeavored to bring all the resources of science to bear for the betterment of human life.

"Euthenics" gives a simple, intelligible view of all these related movements. They all mean a better control of environment for the purpose of increasing human efficiency. In this controlled environment the work of the housewife looms large.

Given as a table in the appendix we find the schedule of agencies contributing to a better common life. Its grouping shows a statesman like vision, and the reader is impressed with the fact that however slowly this outline may be filled out with effective work by the public, such coöperation will be largely the result of the foresight and labors of such leaders as Mrs. Richards.

B. R. ANDREWS.

Proceedings of the Third International Congress for Home Education.

These proceedings comprise eight volumes in which the greatest specialists in pedagogy discuss the study of childhood, the education of children before, during, and after their school years, the education of abnormal children, and the various subjects relating to childhood. The exchange of opinions which was evoked at the Congress by the papers presented will be published in a separate volume, the ninth in the series which appear shortly. The ninth volume will be sent to all persons registered with the Secretary General of the Congress, L. Pien, 44 Rue Rubens, Brussels, Belgium, before January 1, 1911. Such persons will be considered members of the Congress and will receive the nine volumes upon payment of the dues, 10 francs (\$2). After that date these publications will be found only in the hands of booksellers at a price considerably higher.

These nine volumes contain more than 300 articles. A certain number of papers—in the neighborhood of 100—were not received by the Bureau in time for publication. The members of the Congress will find these reviewed in the *Revue de l'Education familiale*, of which sample copies may be obtained free of charge by applying to the Secretary General as mentioned above.

Probably the Fourth International Congress for Home Education will be held in the United States. A commission has been appointed to take the matter under consideration. Professor Monroe of the State Normal School, Montclair, N. J., was appointed Secretary of this commission.

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